

FIELD MAINTENANCE PRINT SET

"THIS DRAWING AND SPECIFICATIONS, HEREIN, ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION. COPYRIGHT © 1978 . DIGITAL EQUIPMENT CORPORATION."

B-TC-FP780-0-1	FP780 FLOATING POINT ACCELERATOR (TC)
B-DD-FP780-0	FP780 FLOATING POINT ACCELERATOR (DD)
E-UA-FP780-0-0	FP780 FLOATING POINT ACCELERATOR
D-BD-FP780-0-2	FP780 FLOAT. PT. ACCEL. (BLOCK DIAGRAM)
E-UA-M8285-0-0	FRACTION NORMALIZER (MODULE)
B-PL-M8285-0-0	FRACTION NORMALIZER (PARTS LIST)
D-CS-M8285-0-1	FRACTION NORMALIZER (SCHEMATIC)
E-UA-M8286-0-0	FRACTION MULTIPLIER HIGH (MODULE)
K-PL-M8286-0-0	FRACTION MULTIPLIER HIGH (PARTS LIST)
D-CS-M8286-0-1	FRACTION MULTIPLIER HIGH (SCHEMATIC)
E-UA-M8287-0-0	FRACTION MULTIPLIER LOW (MODULE)
K-PL-M8287-0-0	FRACTION MULTIPLIER LOW (PARTS LIST)
D-CS-M8287-0-1	FRACTION MULTIPLIER LOW (SCHEMATIC)
E-UA-M8288-0-0	FRACTION ADDER (MODULE)
B-PL-M8288-0-0	FRACTION ADDER (PARTS LIST)
D-CS-M8288-0-1	FRACTION ADDER (SCHEMATIC)
E-UA-M8289-0-0	FPA CONTROLLER (MODULE)
K-PL-M8289-0-0	FPA CONTROLLER (PARTS LIST)
D-CS-M8289-0-1	FPA CONTROLLER (SCHEMATIC)

UNIT VARIATIONS
COVERED BY THIS
PRINT SET

FP780-AA

FP780-AB

FP780
**Field Maintenance
Print Set**

Digital Equipment Corporation

PRINT SET ORDER NO.
MP00565

REVISIONS	REV.		USED ON OPTION/MODEL		DRN.	DATE	<div style="display: flex; justify-content: space-between;"> <div> TITLE: FP780 FLOATING POINT ACCELERATOR </div> <div style="border: 1px solid black; padding: 2px;"> digital </div> </div>			
	CHG. NO.		11780-C		B. BLODGETT	JAN 78				
	DATE		11780-D		CHK'D	DATE				
					D. Dooey	16 FEB 78				
					PROJ. ENG.	DATE				
					A. Helms	27 FEB 78				
					FIELD SERV.	DATE				
					Bill Freeman	27 FEB 78				
			SHEET 1 OF 1							

"THE MATERIAL HEREIN IS FOR INFORMATION PURPOSES ONLY AND IS SUBJECT TO CHANGE WITHOUT NOTICE. DIGITAL EQUIPMENT CORPORATION ASSUMES NO RESPONSIBILITY FOR ANY ERRORS WHICH MAY APPEAR HEREIN."

DRAWING DIRECTORY

THIS DRAWING AND SPECIFICATIONS, HEREIN, ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION. COPYRIGHT © 1977
DIGITAL EQUIPMENT CORPORATION.

FOR FIELD MAINTENANCE PRINT SET SEE: B-TC-FP78Ø-Ø-1

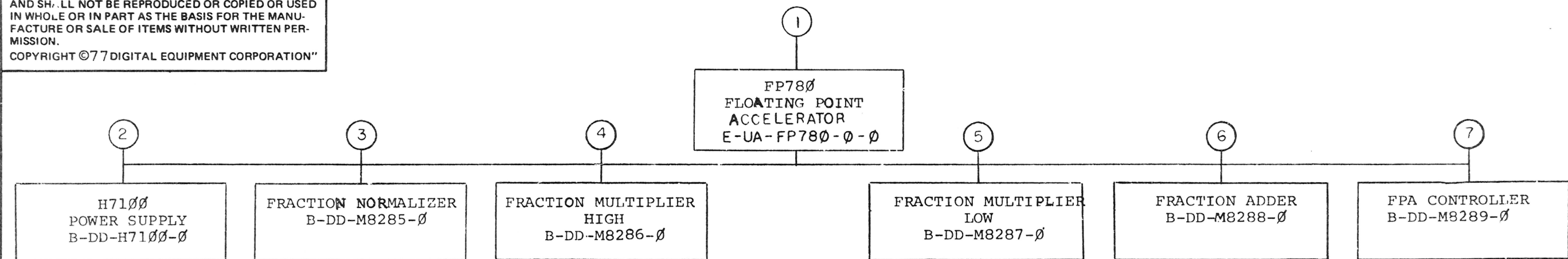
UNIT VARIATIONS

[illegible]

REVISIONS	REV.		USED ON OPTION/MODEL	DRN.	DATE	<div>digital</div> <div>FP780 FLOATING POINT ACCELERATOR</div>										
	CHANGE NO.			B. BLODGETT	01 DEC 77											
				CHK'D.	DATE											
	CHK			11780 - C	<i>D. Hooley</i>	16 FEB 78										
				11780 - D												
					PROJ. ENG.	DATE										
					<i>A. Helms</i>	27 Feb 78										
			PROD.	DATE												
			SHEET 1 OF 3	<i>J. Rosen</i>	5/29/78											

"THIS DRAWING AND SPECIFICATIONS, HEREIN, ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION.
COPYRIGHT ©77 DIGITAL EQUIPMENT CORPORATION"

REV.	NUMBER FP780-0	DD CODE	B SIZE
------	-------------------	------------	-----------



TITLE	FP780 FLOATING POINT ACCELERATOR	SHEET 2 OF 3	SIZECODE B DD	NUMBER FP780-0	REV
-------	-------------------------------------	--------------	------------------	-------------------	-----

FIND NO.	DRAWING NO.	DESCRIPTION	TYPE
	B-TC-FP780-0-1 MP00565	(TABLE OF CONTENTS) FP780 FLOATING PT ACCELERATOR (PRINT SET ORDER NO) FP780 FLOATING PT ACCELERATOR	- -
1	E-UA-FP780-0-0 D-IA-7014249-0-0 D-IA-7014530-0-0 D-IA-7014213-0-0	FP780 FLOATING POINT ACCELERATOR LOGIC POWER CABLE (BLK) LOGIC POWER CABLE (RED) OVER TEMP CABLE	E/M M M M
2	B-DD-H7100-0	H7100 POWER SUPPLY	E/M
3	B-DD-M8285-0	FRACTION NORMALIZER	E/M
4	B-DD-M8286-0	FRACTION MULTIPLIER, HIGH	E/M
5	B-DD-M8287-0	FRACTION MULTIPLIER, LOW	E/M
6	B-DD-M8288-0	FRACTION ADDER	E/M
7	B-DD-M8289-0	FPA CONTROLLER	E/M

TYPE:

E ELECTRICAL
M MECHANICAL
E/M ELECTRO/MECHANICAL

digital

TITLE

FP780 FLOATING POINT
ACCELERATOR

SHEET 3 OF 3

SIZE

CODE

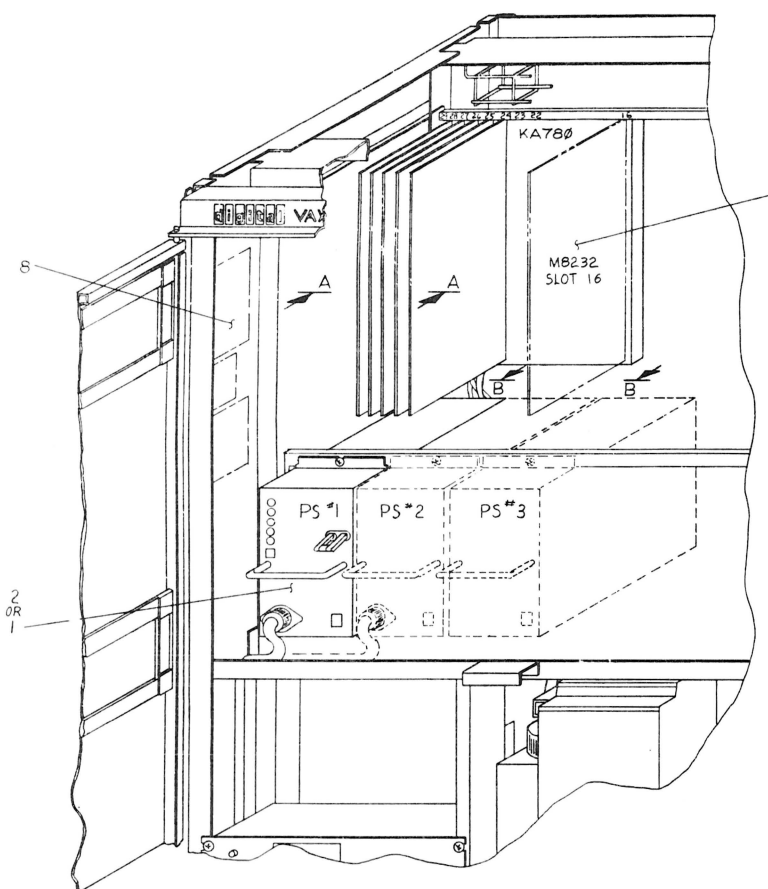
B DD

NUMBER

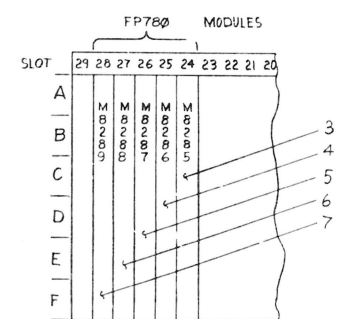
FP780-0

REV

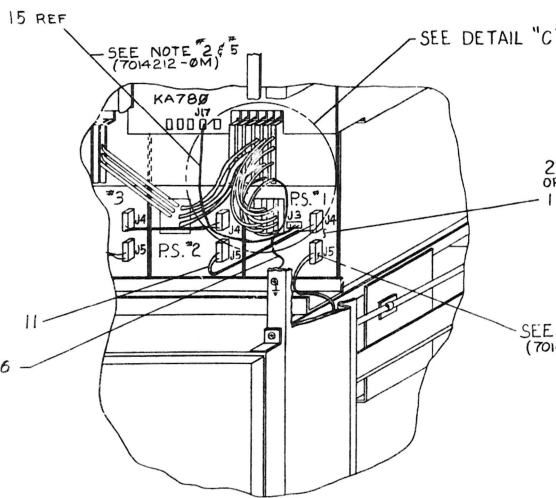
THIS DRAWING AND SPECIFICATIONS, HEREIN, ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR COPIED IN WHOLE OR IN PART, OR IN ANY MANNER, WITHOUT THE WRITTEN PERMISSION OF DIGITAL EQUIPMENT CORPORATION.



FRONT VIEW OF VAX 11/780



VIEW A-A
MODULE SIDE OF KA780 B.P.
SCALE: NONE



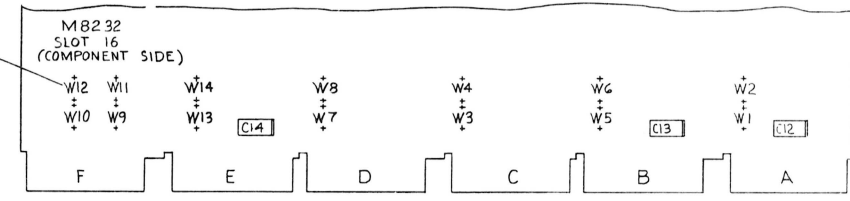
VIEW B-B
REAR VIEW

WIRE TABLE					
ITEM NO	DESCRIPTION	FROM		TO	
		CONN	WITH	CONN	WITH
10	B	RED	+5A-A	10-32 NUT	+5V-A
11			+5A-B		+5V-B
12			+5A-C		+5V-C
13	RED	+5A-D		+5V-D	
14			+5A-RET-A		+5V-RET-A
15	BLK	+5A-RET-B		+5V-RET-B	
16			+5A-RET-C		+5V-RET-C
17	B	BLK	+5A-RET-D	10-32 NUT	+5V-RET-D
18			PS1-J4		PS2-J5
19			PS1-J3		KA780 J17
20	REF		PS1-J5		SEE NOTE 7

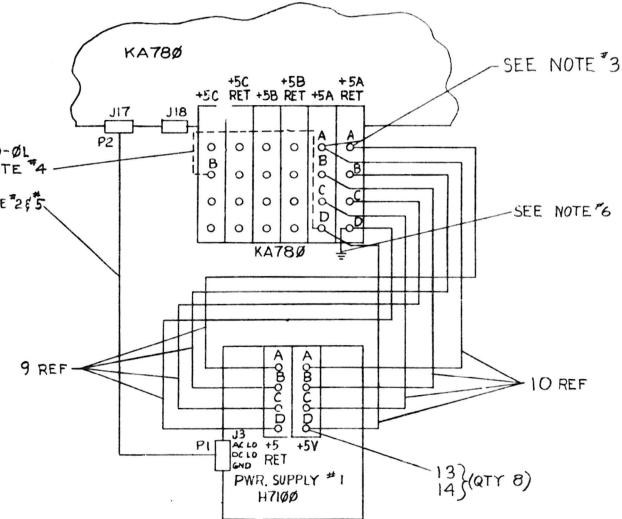
LEGEND	
NUMBER	VARIATION
FP780-AA	115V, 60 HZ
FP780-AB	230V, 50 HZ

- NOTES:
- LOGIC JUMPERS (ITEM #12) ARE TO BE INSTALLED ON THE EXISTING CLOCK MODULE (M8232), SUPPLIED WITH THE CPU ASSY (KA780), IN THE LOCATIONS MARKED W1 THRU W14, USING SOLDER.
 - REFER TO 11780 SUB-SYSTEM INTERCONNECT DWG. D-1C-11780-0-3 FOR CABLE CONNECTIONS.
 - MOUNTING HARDWARE (#10-32 NUT & PLASTIC RETAINER) FOR LOGIC POWER CABLES, IS SUPPLIED WITH THE KA780 BACK PLANE ASSY.
 - REMOVE JUMPER WHEN FP780 IS INSTALLED. REFER ALSO TO D-1C-11780-0-3 SHEETS 4 AND 5.
 - REMOVE END OF CABLE PLUGGED INTO J13 OF DW780 AND PLUG INTO J3 OF PWR. SUPPLY #1.
 - WHEN INSTALLATION OF WIRE FROM PS. #1 (+5 RET-D) TO KA780 (+5A RET-D) IS COMPLETE, MAKE SURE THAT WIRE FROM KA780 (+5 RET-D) TO CABINET FRAME REMAINS CONNECTED.
 - REFER TO 11780 SYSTEM INTERCONNECT DIAGRAM D-1C-11780-0-2 FOR CABLE CONNECTIONS AND D-1C-11780-0-1 FOR SYSTEM POWER DIAGRAM INFO.

12 (QTY 14)



DETAIL "D"
EXISTING CLOCK MODULE (M8232)
SEE NOTE #1

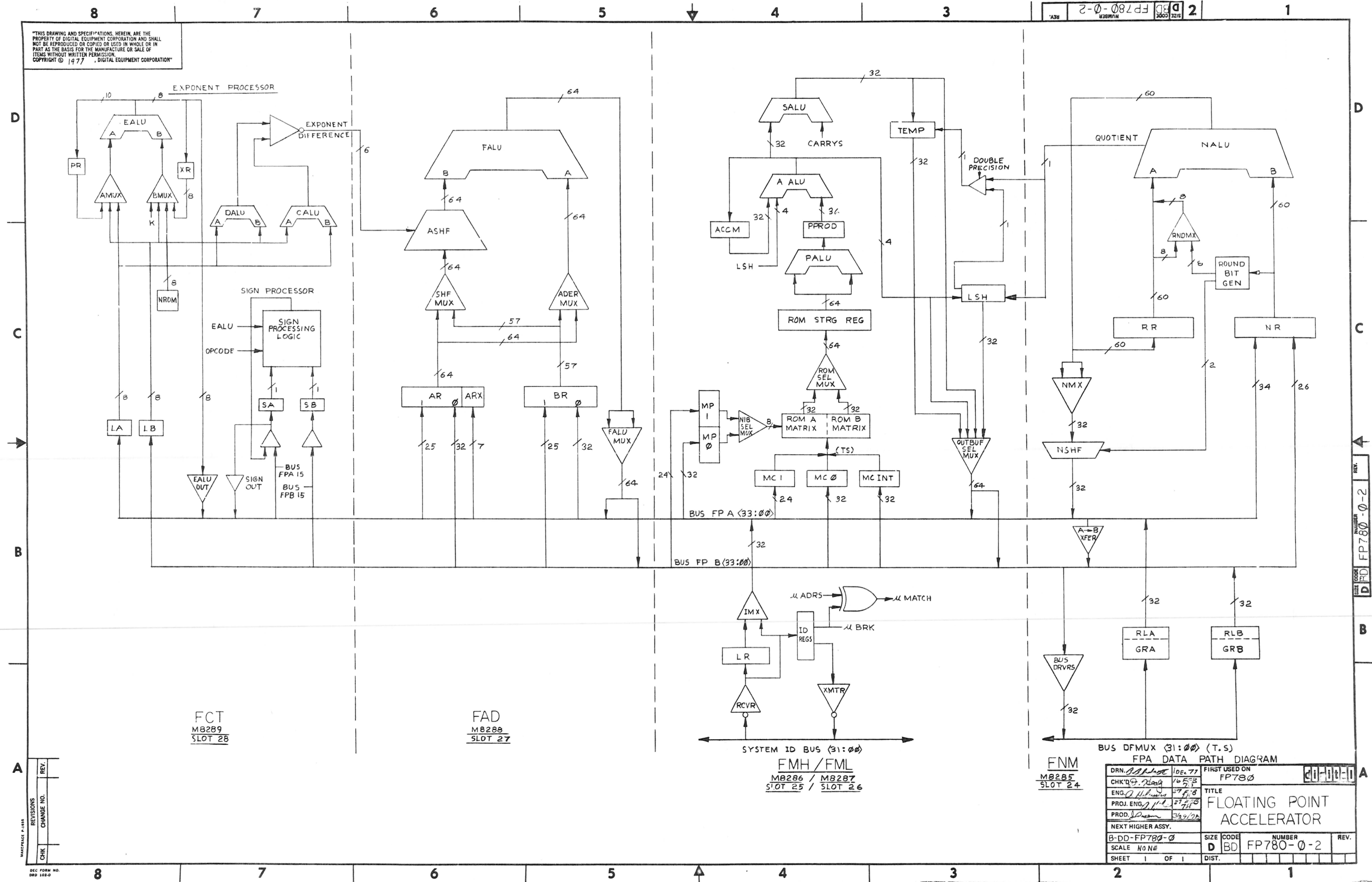


DETAIL "C"
SEE WIRE TABLE

REF	11780 SUB-SYSTEM INTERCONNECT	D-1C-11780-0-3	15
8	B	WASHER, LOCK SPLIT #10	9007906-00
8	B	SCR, PH HD PAN #10-32X.50	9006073-01
14	14	JUMPER, INSULATED	9009185-00
1	1	OVER TEMP. CABLE	D-1A-7014213-0K0
4	4	LOGIC POWER CABLE (RED)	D-1A-7014530-0L0
4	4	LOGIC POWER CABLE (BLK)	D-1A-7014249-0L0
1	1	STICKER, MODULE UTILIZATION	3615084-00
1	1	FRA. CONTROLLER	D-1A-M8289-0-0
1	1	FRACTION ADDER	D-1A-M8288-0-0
1	1	FRACTION MULTIPLIER, LOW	D-1A-M8287-0-0
1	1	FRACTION MULTIPLIER, HIGH	D-1A-M8286-0-0
1	1	FRACTION NORMALIZER	D-1A-M8285-0-0
1	1	PWR. SUPPLY 230V, 50HZ	D-1A-H7100-0-0
1	1	PWR. SUPPLY 115V, 60HZ	D-1A-H7100-A-0

QUANTITY & VARIATION	DESCRIPTION	DWG PART NO.	ITEM NO.
1	FP780	FP780-AA	1
1	FP780	FP780-AB	2
1	FP780	FP780-0-0	3
1	FP780	FP780-0-1	4
1	FP780	FP780-0-2	5
1	FP780	FP780-0-3	6
1	FP780	FP780-0-4	7
1	FP780	FP780-0-5	8
1	FP780	FP780-0-6	9
1	FP780	FP780-0-7	10
1	FP780	FP780-0-8	11
1	FP780	FP780-0-9	12
1	FP780	FP780-0-10	13
1	FP780	FP780-0-11	14
1	FP780	FP780-0-12	15
1	FP780	FP780-0-13	16
1	FP780	FP780-0-14	17
1	FP780	FP780-0-15	18
1	FP780	FP780-0-16	19
1	FP780	FP780-0-17	20
1	FP780	FP780-0-18	21
1	FP780	FP780-0-19	22
1	FP780	FP780-0-20	23
1	FP780	FP780-0-21	24
1	FP780	FP780-0-22	25
1	FP780	FP780-0-23	26
1	FP780	FP780-0-24	27
1	FP780	FP780-0-25	28
1	FP780	FP780-0-26	29
1	FP780	FP780-0-27	30
1	FP780	FP780-0-28	31
1	FP780	FP780-0-29	32
1	FP780	FP780-0-30	33
1	FP780	FP780-0-31	34
1	FP780	FP780-0-32	35
1	FP780	FP780-0-33	36
1	FP780	FP780-0-34	37
1	FP780	FP780-0-35	38
1	FP780	FP780-0-36	39
1	FP780	FP780-0-37	40
1	FP780	FP780-0-38	41
1	FP780	FP780-0-39	42
1	FP780	FP780-0-40	43
1	FP780	FP780-0-41	44
1	FP780	FP780-0-42	45
1	FP780	FP780-0-43	46
1	FP780	FP780-0-44	47
1	FP780	FP780-0-45	48
1	FP780	FP780-0-46	49
1	FP780	FP780-0-47	50
1	FP780	FP780-0-48	51
1	FP780	FP780-0-49	52
1	FP780	FP780-0-50	53
1	FP780	FP780-0-51	54
1	FP780	FP780-0-52	55
1	FP780	FP780-0-53	56
1	FP780	FP780-0-54	57
1	FP780	FP780-0-55	58
1	FP780	FP780-0-56	59
1	FP780	FP780-0-57	60
1	FP780	FP780-0-58	61
1	FP780	FP780-0-59	62
1	FP780	FP780-0-60	63
1	FP780	FP780-0-61	64
1	FP780	FP780-0-62	65
1	FP780	FP780-0-63	66
1	FP780	FP780-0-64	67
1	FP780	FP780-0-65	68
1	FP780	FP780-0-66	69
1	FP780	FP780-0-67	70
1	FP780	FP780-0-68	71
1	FP780	FP780-0-69	72
1	FP780	FP780-0-70	73
1	FP780	FP780-0-71	74
1	FP780	FP780-0-72	75
1	FP780	FP780-0-73	76
1	FP780	FP780-0-74	77
1	FP780	FP780-0-75	78
1	FP780	FP780-0-76	79
1	FP780	FP780-0-77	80
1	FP780	FP780-0-78	81
1	FP780	FP780-0-79	82
1	FP780	FP780-0-80	83
1	FP780	FP780-0-81	84
1	FP780	FP780-0-82	85
1	FP780	FP780-0-83	86
1	FP780	FP780-0-84	87
1	FP780	FP780-0-85	88
1	FP780	FP780-0-86	89
1	FP780	FP780-0-87	90
1	FP780	FP780-0-88	91
1	FP780	FP780-0-89	92
1	FP780	FP780-0-90	93
1	FP780	FP780-0-91	94
1	FP780	FP780-0-92	95
1	FP780	FP780-0-93	96
1	FP780	FP780-0-94	97
1	FP780	FP780-0-95	98
1	FP780	FP780-0-96	99
1	FP780	FP780-0-97	100

"THIS DRAWING AND SPECIFICATIONS, HEREIN, ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION.
COPYRIGHT © 1977, DIGITAL EQUIPMENT CORPORATION"

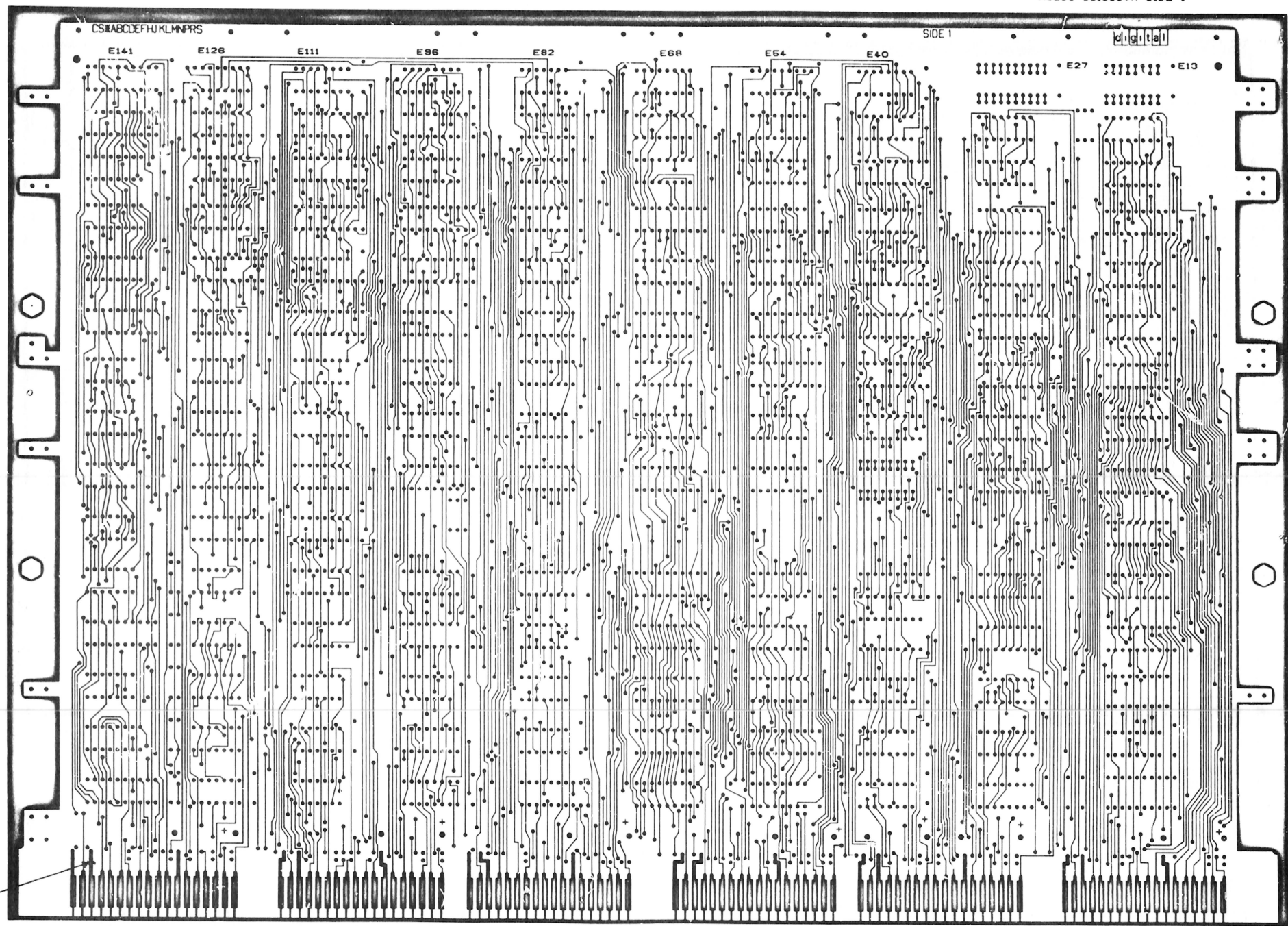




ALL DIMENSIONS AND SPECIFICATIONS ARE IN INCHES AND THE
PROPERTY OF BELL TELEPHONE COMPANY. NO PART OF THIS
DRAWING IS TO BE REPRODUCED OR COPIED IN ANY MANNER
WITHOUT THE WRITTEN PERMISSION OF BELL TELEPHONE
COMPANY. 1977

SYSTEM 1

M8285 5013084A SIDE 1



REVISIONS		
CHK	CHANGE NO	REV

TITLE		SIZE/COORD	NUMBER	REV
FRACTION NORMALIZER		E 1/4	M8285-0-0	*
SCALE	2-1	SHEET	2 OF 3	DIST

THIS DRAWING AND SPECIFICATIONS HEREIN ARE THE
PROPERTY OF DATA EQUIPMENT CORPORATION AND SHALL
NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN
PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF
OTHER EQUIPMENT WITHOUT PERMISSION
COPYRIGHT © 1977 DATA EQUIPMENT CORPORATION

LAYER 4

W8382 2013087
L/M SIDE S

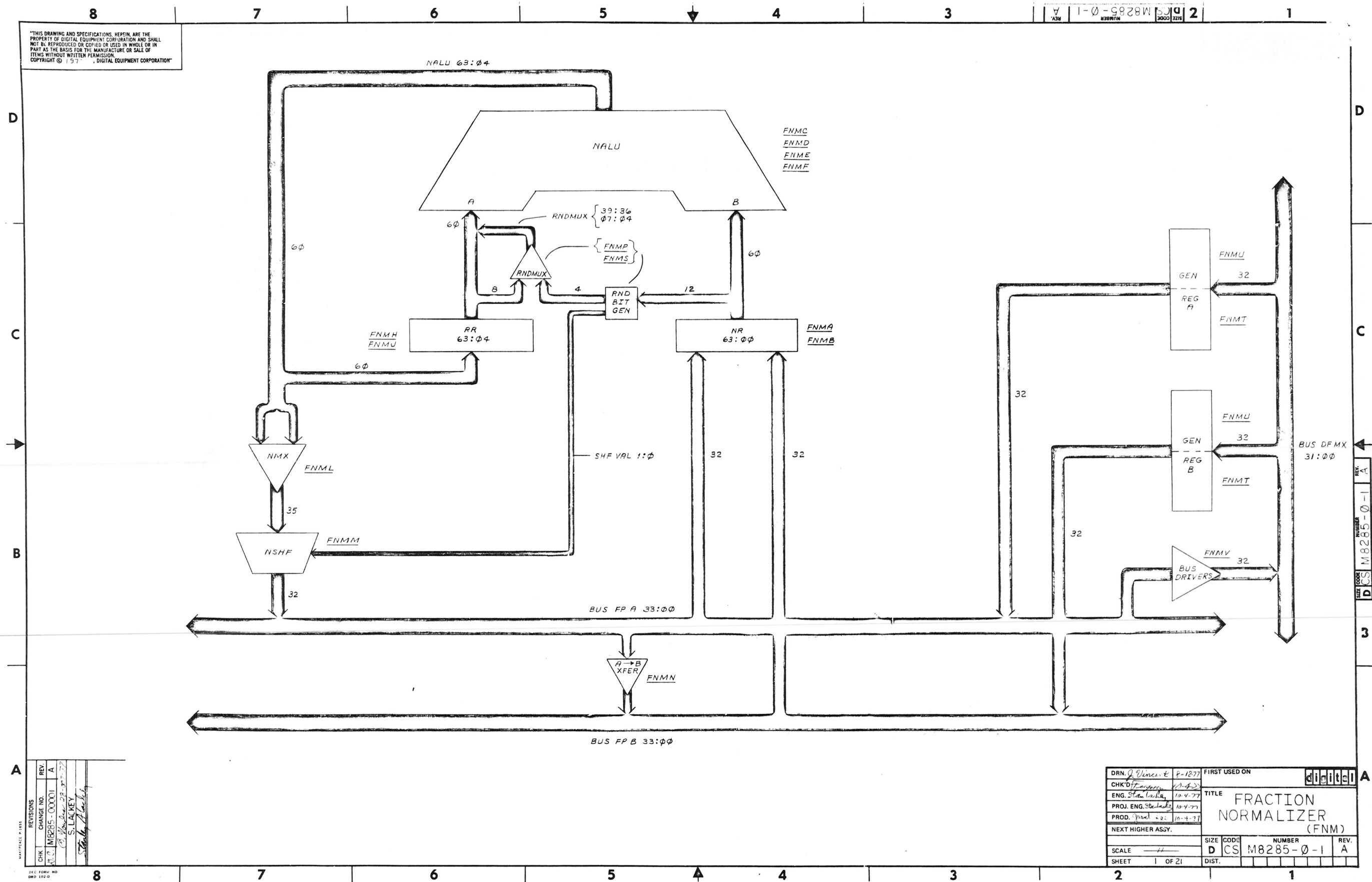
REVISIONS		
CHK	CHANG' NO	REV

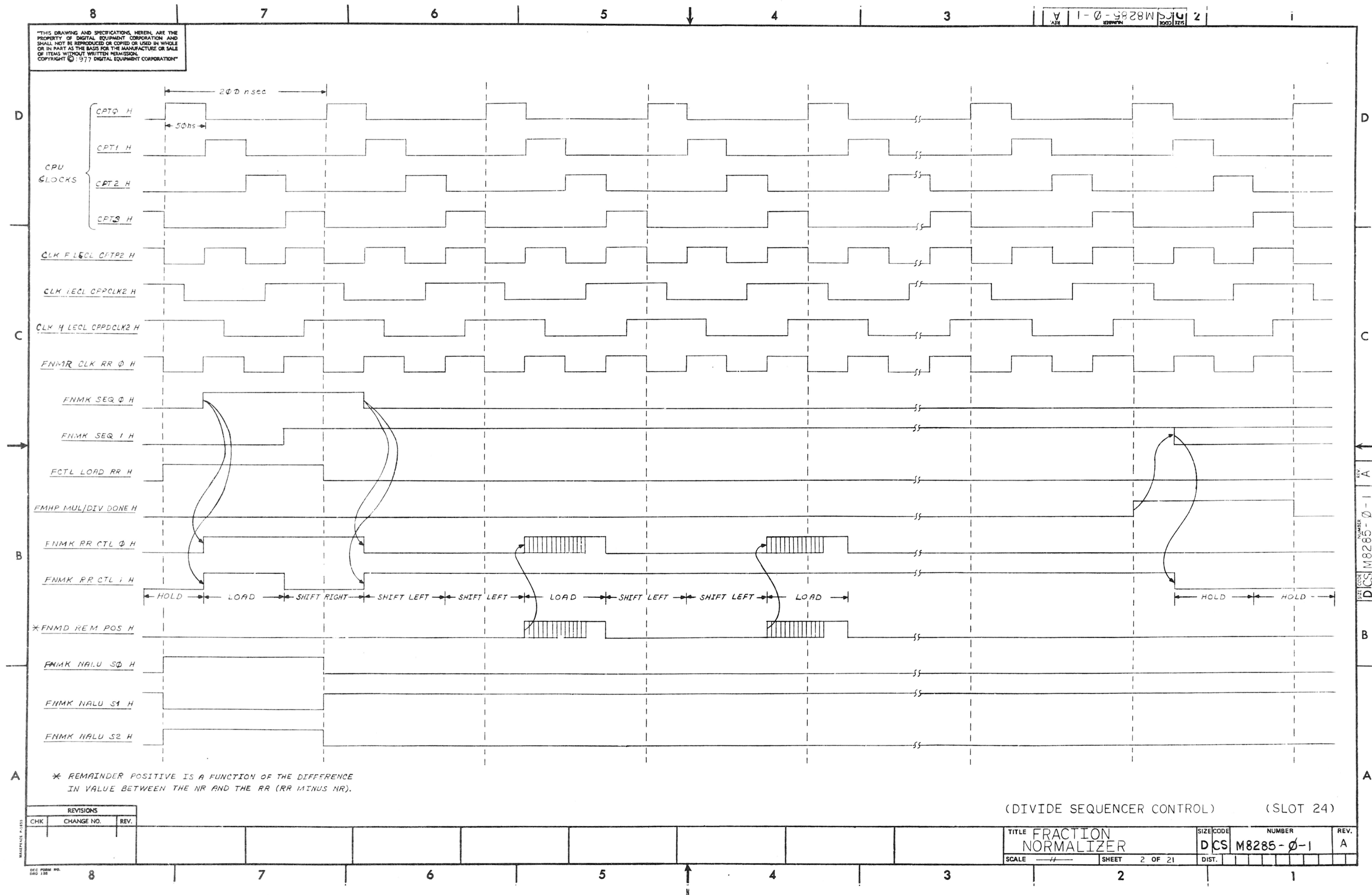
DEC FORM NO
REV 100

TITLE		SHEET CODE	NUMBER	REV
FRACTION NORMALIZER		EUA	MB285-0-0	*
SCALE 2-1	SHEET 3 OF 3	DIST	1	

DIGITAL EQUIPMENT CORPORATION PARTS LIST				QUANTITY / VARIATION												NOTES:							
MADE BY DATE		M. FUNARO 20 JULY 77		CHECKED DATE		J. Giammarino 9-6-77		SECTION															
ENG DATE		Stan Lache 4-oct-77		PROD DATE		Mike Tenillo 9-27-77		ISSUED SECTION															
ITEM NO.		DRAWING NO.		PART NO.		DESCRIPTION		M8285-0-0															
										REF DESIGNATION													
1		D-MD-5013084-0-0		5013084		ETCH BOARD																	
2				1910532		I.C. DEC 74S00		3		E79, E85, E116													
3				1910534		I.C. DEC 74S04		4		E75, E97, E99, E133													
4				1912389		I.C. DEC 74S08		2		E98, E129													
5				1910539		I.C. DEC 74S20		1		E112													
6				1912746		I.C. DEC 74S37		3		E70, E82, E119													
7				1910541		I.C. DEC 74S40		1		E90													
8				1911712		I.C. DEC 74S51		3		E72, E91, E120													
9				1910542		I.C. DEC 74S64		7		E114, E115, E121, E131, E132, E134, E135													
10				1910544		I.C. DEC 74S74		3		E71, E80, E113													
11				1910548		I.C. DEC 74S157		11		E52, E53, E62, E63, E64, E76, E77, E78, E81, E95, E105													
12				1910549		I.C. DEC 74S158		2		E84, E83													
13				1912097		I.C. DEC 74S182		5		E37, E51, E94, E110, E139													
14				1910552		I.C. DEC 74S194		32		E8, E9, E11, E12, E39, E40, E41, E43, E44, E46, E54, E66, E67, E68, E86, E87, E88, E89, E96, E100, E101, E102, E103, E104, E107, E111, E123, E124, E125, E126, E137, E138													
15				1913493		I.C. DEC 74S241		1		E69													
16				1913670		I.C. DEC 74S373		8		E2, E10, E19, E22, E31, E34, E42, E59													
17				1913700		I.C. DEC 74S381		15		E36, E38, E48, E49, E50, E65, E92, E93, E106, E108, E109, E122, E136, E140, E141													
18				23034B1-00		I.C. 256 X 8 BI POLAR TRI-STATE PROM		1		E127													
E.C.O. NO.																							
THIS DRAWING AND SPECIFICATIONS, HEREIN, ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION. COPYRIGHT © 1977 DIGITAL EQUIPMENT CORPORATION								TITLE FRACTION NORMALIZER				ASSY NO. E-UA-M8285-0-0				SIZE B		CODE PL		NUMBER M8285-0-0		REV. *	
								SHEET 1 OF 2				INSERTION PARTS LIST DATA BASE REV A											

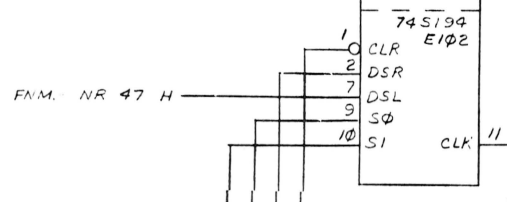
DIGITAL EQUIPMENT CORPORATION PARTS LIST				QUANTITY / VARIATION										NOTES:					
MADE BY DATE		M. FUNARO 20 JULY 77		CHECKED DATE		L. Giammarino 9-6-77		SECTION											
ENG DATE		Star Locking 4-Oct-77		PROD DATE		Mike Truella 9-27-77		ISSUED SECTION											
ITEM NO.	DRAWING NO.	PART NO.	DESCRIPTION	M8285-0-0												REF DESIGNATION			
19		1912693	I.C. DEC 25S10	9												E25,E26,E35,E45,E47,E60,E61,E73,E74			
20		1912586	I.C. DEC 85S68	16												E3,E4,E5,E6,E7,E17,E18,E20,E21,E23,E24,E33,E55,E56,E57,E58			
21		1913888-00	I.C. DEC DC102	3												E117,E118,E130			
22		1913294	I.C. DEC 93S16	1												E128			
23		1911402	I.C. DEC 10105	1												E16			
24		1911403	I.C. DEC 10106	1												E15			
25		1911415-01	I.C. DEC 10125-1	3												E28,E29,E30			
26		1913220-00	I.C. DEC 10216	1												E14			
27		1911413	I.C. DEC 10121	1												E1			
28		1301972	RESISTOR, 270 OHM, 1/4W, 5%	6												R1,R3,R5,R7,R9,R40			
29		1301890	RESISTOR, 560 OHM, 1/4W 5%	6												R2,R4,R6,R8,R10,R41			
30		1300295	RESISTOR, 330 OHM, 1/4W, 5%	13												R15 thru R20,R29 thru R35			
31		1300247	RESISTOR, 120 OHM, 1/4W, 5%	8												R11,R12,R25,R26,R27,R28,R36,R37			
32		1300250	RESISTOR, 150 OHM, 1/4W, 5%	8												R13,R14,R21,R22,R23,R24,R38,R39			
33		1012084-01	CAPACITOR, 8 uf, 25 V	7												C3 thru C9			
34		1012784	CAPACITOR, .047 uf, 50 V	55												C1,C2,C10 thru C56,C62,C59,C60,C61			
35		1210711-02	HANDLE	1															
36		9000024-01	EYELETS	12															
37			SPARE ICS	3												E13,E27,E32			
E.C.O. NO.																			
"THIS DRAWING AND SPECIFICATIONS, HEREIN, ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION. COPYRIGHT © 1977 DIGITAL EQUIPMENT CORPORATION"				TITLE FRACTION NORMALIZER				ASSY NO. E-UA-M8285-0-0				SIZE B		CODE PL		NUMBER M8285-0-0		REV. *	
								SHEET 2 OF 2				INSERTION PARTS LIST DATA BASE REV A							



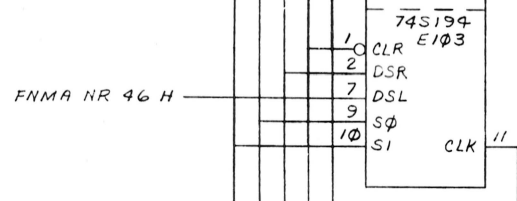


THIS DRAWING AND SPECIFICATIONS, HEREIN, ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION.
COPYRIGHT © 1977 DIGITAL EQUIPMENT CORPORATION

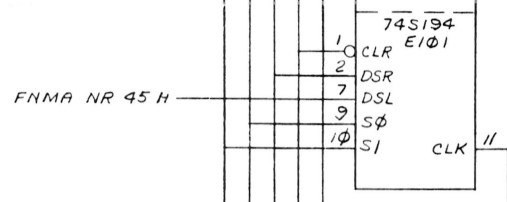
BUS FP A 33 H FUI 3 D0 R0(1) 15 FNMA NR 63 H (FNMC, P, S)
BUS FP A 34 H FMI 4 D1 R1(1) 14 FNMA NR 59 H (FNMC, P)
BUS FP A 35 H EUI 5 D2 R2(1) 13 FNMA NR 55 H (FNMC, P)
BUS FP A 28 H EDI 6 D3 R3(1) 12 FNMA NR 51 H (FNMC)



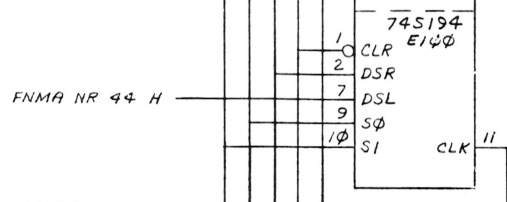
BUS FP A 32 H FSI 3 D0 R0(1) 15 FNMA NR 62 H (FNMC, P, S)
BUS FP A 33 H FSI 4 D1 R1(1) 14 FNMA NR 58 H (FNMC, P)
BUS FP A 31 H ESI 5 D2 R2(1) 13 FNMA NR 54 H (FNMC, P)
BUS FP A 27 H ECI 6 D3 R3(1) 12 FNMA NR 50 H (FNMC)



BUS FP A 36 H FRI 3 D0 R0(1) 15 FNMA NR 61 H (FNMC, P, S)
BUS FP A 32 H FEI 4 D1 R1(1) 14 FNMA NR 57 H (FNMC, P)
BUS FP A 33 H EUI 5 D2 R2(1) 13 FNMA NR 53 H (FNMC, P)
BUS FP A 26 H DLI 6 D3 R3(1) 12 FNMA NR 49 H (FNMC)

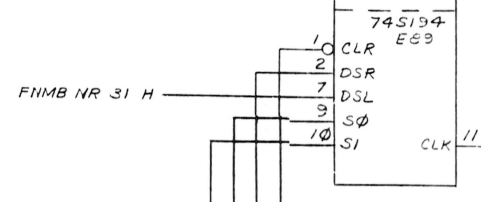


BUS FP A 35 H FPI 3 D0 R0(1) 15 FNMA NR 60 H (FNMC, P)
BUS FP A 31 H BFI 4 D1 R1(1) 14 FNMA NR 56 H (FNMC, P)
BUS FP A 29 H CFI 5 D2 R2(1) 13 FNMA NR 52 H (FNMC, P)
BUS FP A 25 H DKI 6 D3 R3(1) 12 FNMA NR 48 H (FNMC)

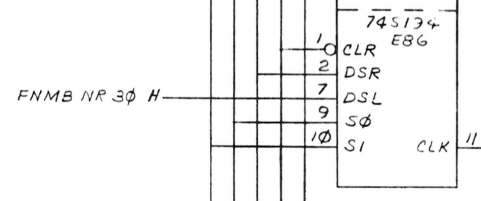


FNMA NR 51 A H
FNMA NR 50 A H
FNMA +3V H
FNMA CLK NR 0 H

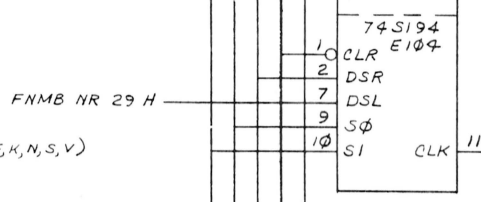
BUS FP A 24 H DFI 3 D0 R0(1) 15 FNMA NR 47 H (FNMA, D)
BUS FP A 20 H CSI 4 D1 R1(1) 14 FNMA NR 43 H (FNMD)
BUS FP A 16 H BBI 5 D2 R2(1) 13 FNMA NR 39 H (FNMD)
BUS FP B 12 H FP2 6 D3 R3(1) 12 FNMA NR 35 H (FNMD)



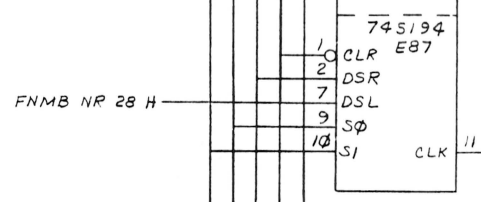
BUS FP A 23 H DEI 3 D0 R0(1) 15 FNMA NR 46 H (FNMA, D)
BUS FP A 19 H BPI 4 D1 R1(1) 14 FNMA NR 42 H (FNMD)
BUS FP B 15 H FU2 5 D2 R2(1) 13 FNMA NR 38 H (FNMD)
BUS FP B 11 H FM2 6 D3 R3(1) 12 FNMA NR 34 H (FNMD)



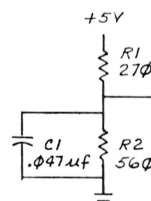
BUS FP A 22 H DAI 3 D0 R0(1) 15 FNMA NR 45 H (FNMA, D)
BUS FP A 18 H BNI 4 D1 R1(1) 14 FNMA NR 41 H (FNMD)
BUS FP B 14 H FS2 5 D2 R2(1) 13 FNMA NR 37 H (FNMD)
BUS FP B 10 H FJ2 6 D3 R3(1) 12 FNMA NR 33 H (FNMD)



BUS FP A 21 H CUI 3 D0 R0(1) 15 FNMA NR 44 H (FNMA, D)
BUS FP A 17 H BFI 4 D1 R1(1) 14 FNMA NR 40 H (FNMD)
BUS FP B 13 H FR2 5 D2 R2(1) 13 FNMA NR 36 H (FNMD)
BUS FP B 09 H FF2 6 D3 R3(1) 12 FNMA NR 32 H (FNMD)



FNMA NR 29 H
FNMA NR 28 H

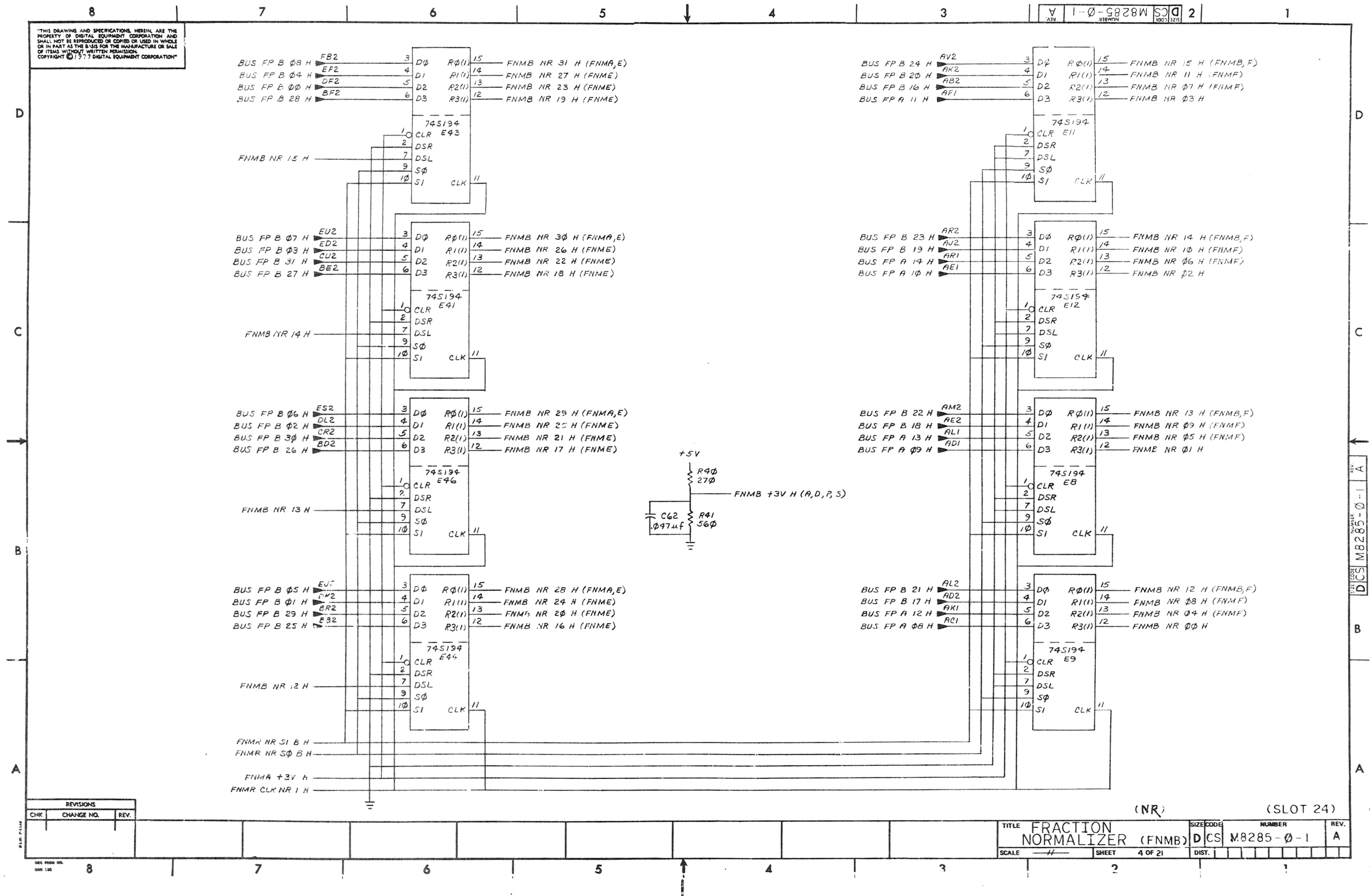


(OPERAND REGISTER

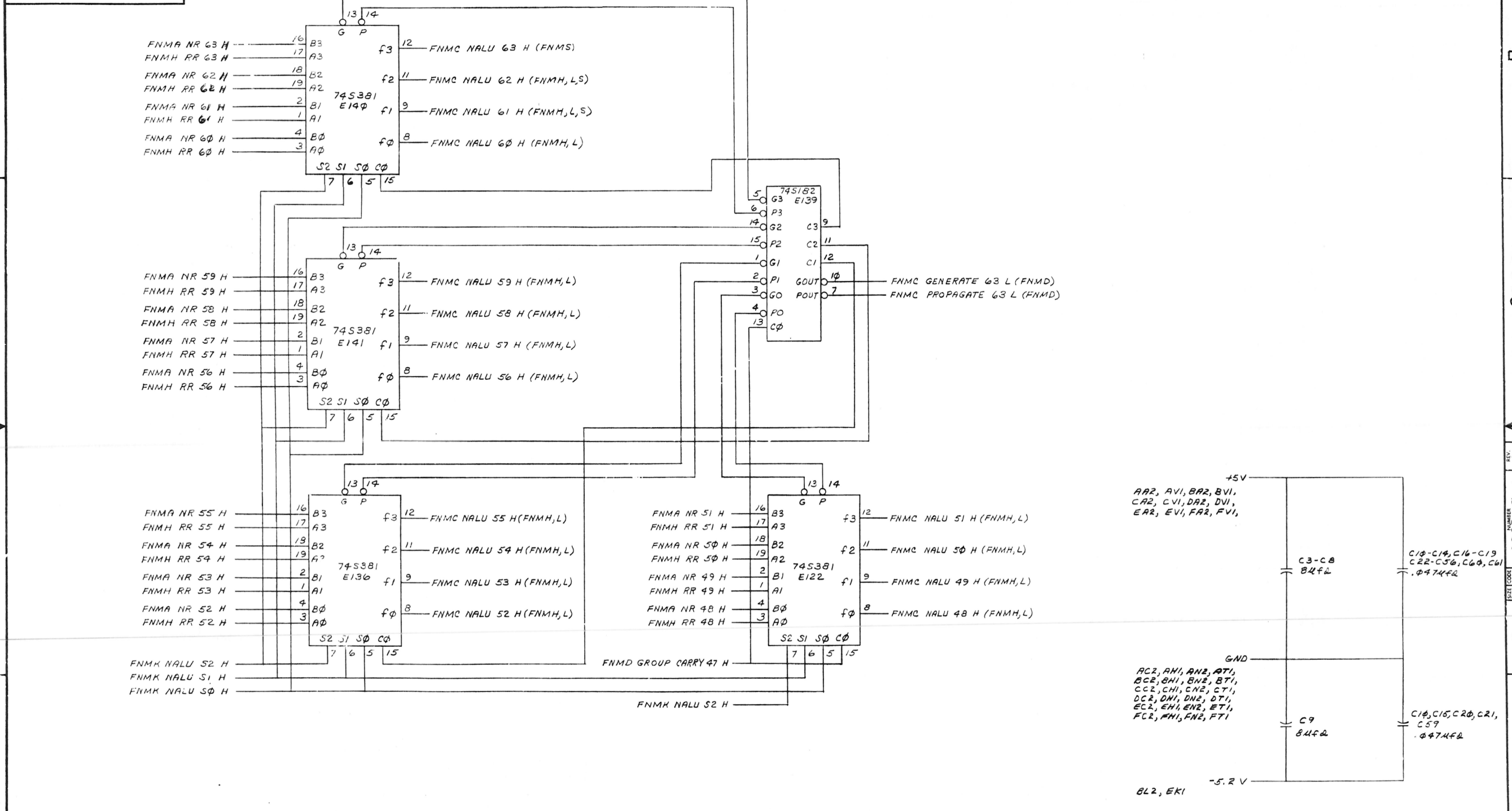
(SLOT 24)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE		SIZE CODE	NUMBER	REV.
FRACTION NORMALIZER (FNMA)		D CS	M8285-0-1	A
SCALE	SHEET	DIST.		
1/2	3 OF 21			

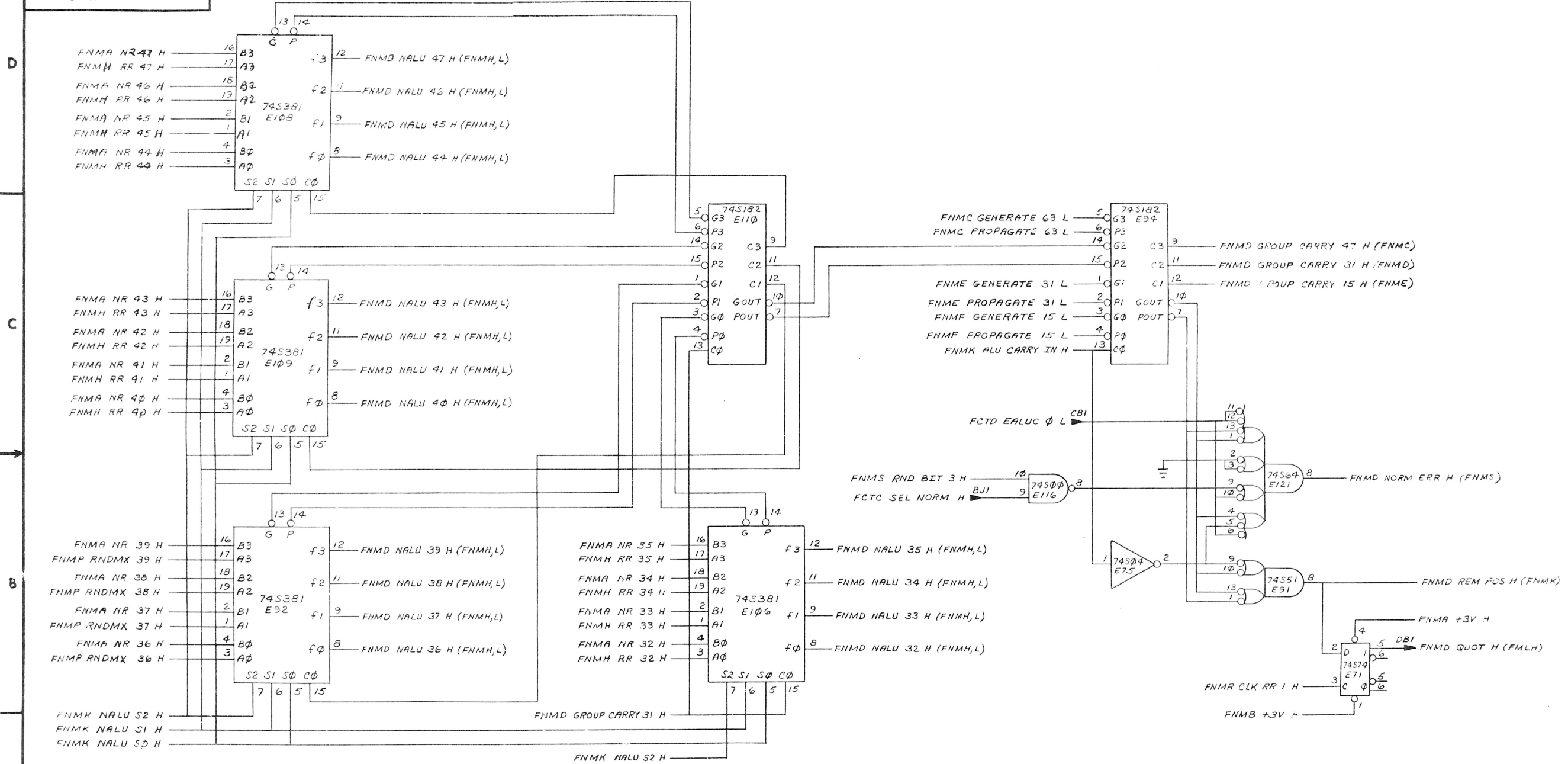


"THIS DRAWING AND SPECIFICATIONS, HEREIN, ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION. COPYRIGHT © 1977 DIGITAL EQUIPMENT CORPORATION"



REVISIONS			TITLE		SIZE CODE		NUMBER		REV.	
CHK	CHANGE NO.	REV.	FRACTION NORMALIZER (FNMC)		DCS		M8285-0-1		A	
			SCALE		SHEET		5 OF 21		DIST.	

THIS DRAWING AND SPECIFICATIONS HEREIN ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION.
COPYRIGHT © 1977 DIGITAL EQUIPMENT CORPORATION

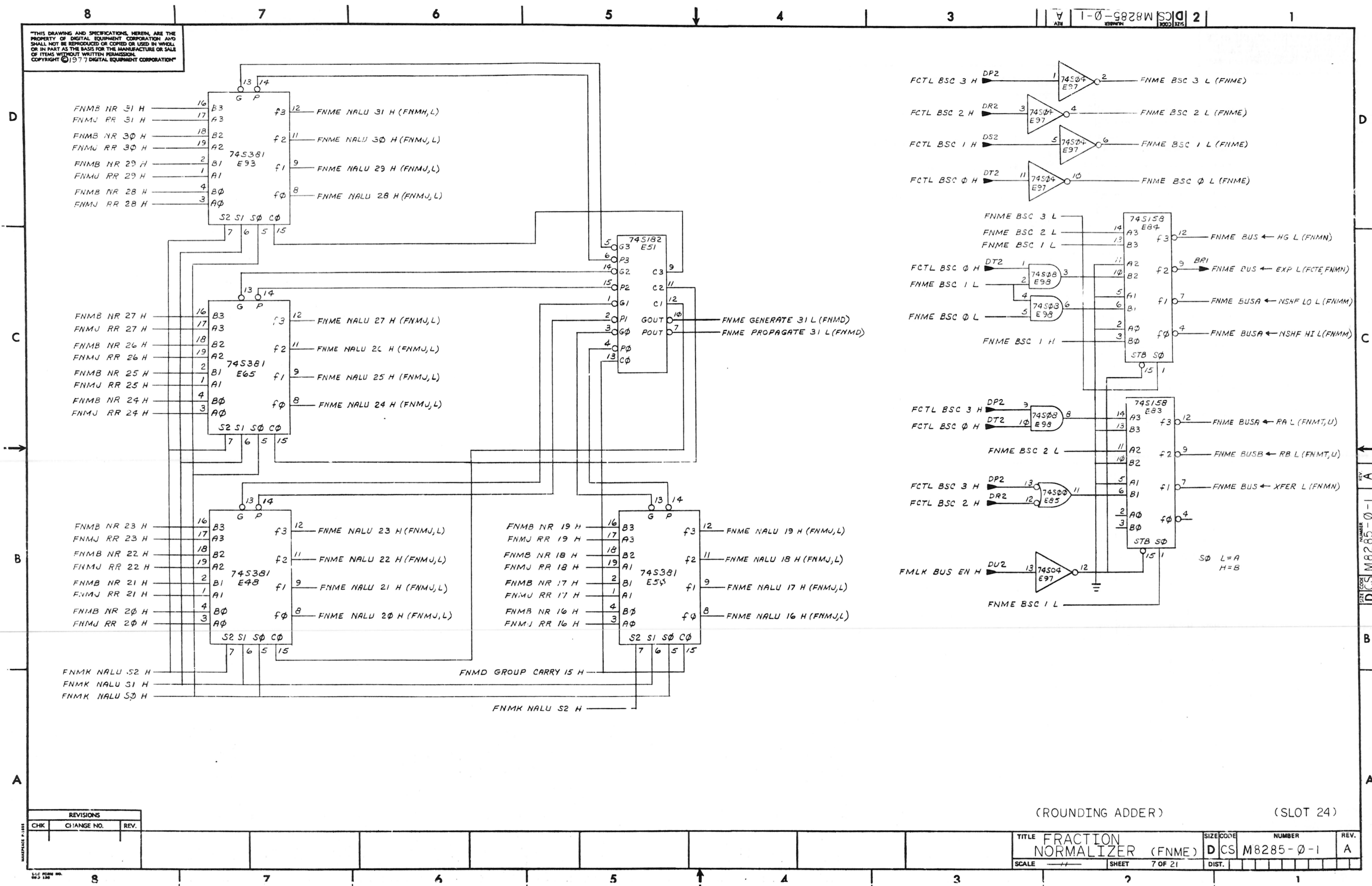


(ROUNDING ADDER) (SLOT 24)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE		SIZE/ODE	NUMBER	REV.
FRACTION NORMALIZER (FNMD)		DCS	M8285-0-1	A
SCALE	SHEET	6 OF 21	DIST.	

"THIS DRAWING AND SPECIFICATIONS, HEREIN, ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION. COPYRIGHT © 1977 DIGITAL EQUIPMENT CORPORATION"

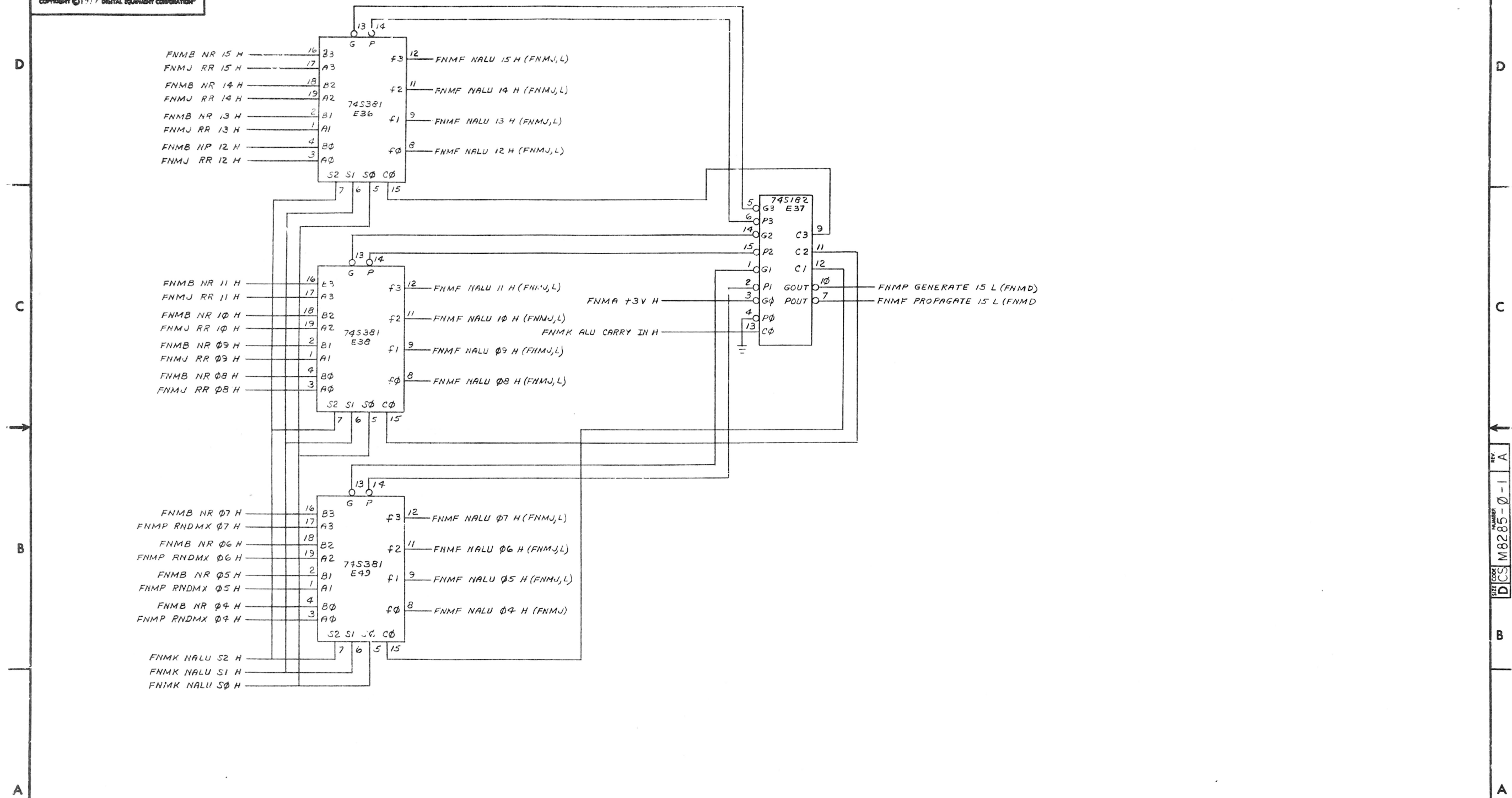


REVISIONS		
CHK	CHANGE NO.	REV.

(ROUNDING ADDER) (SLOT 24)

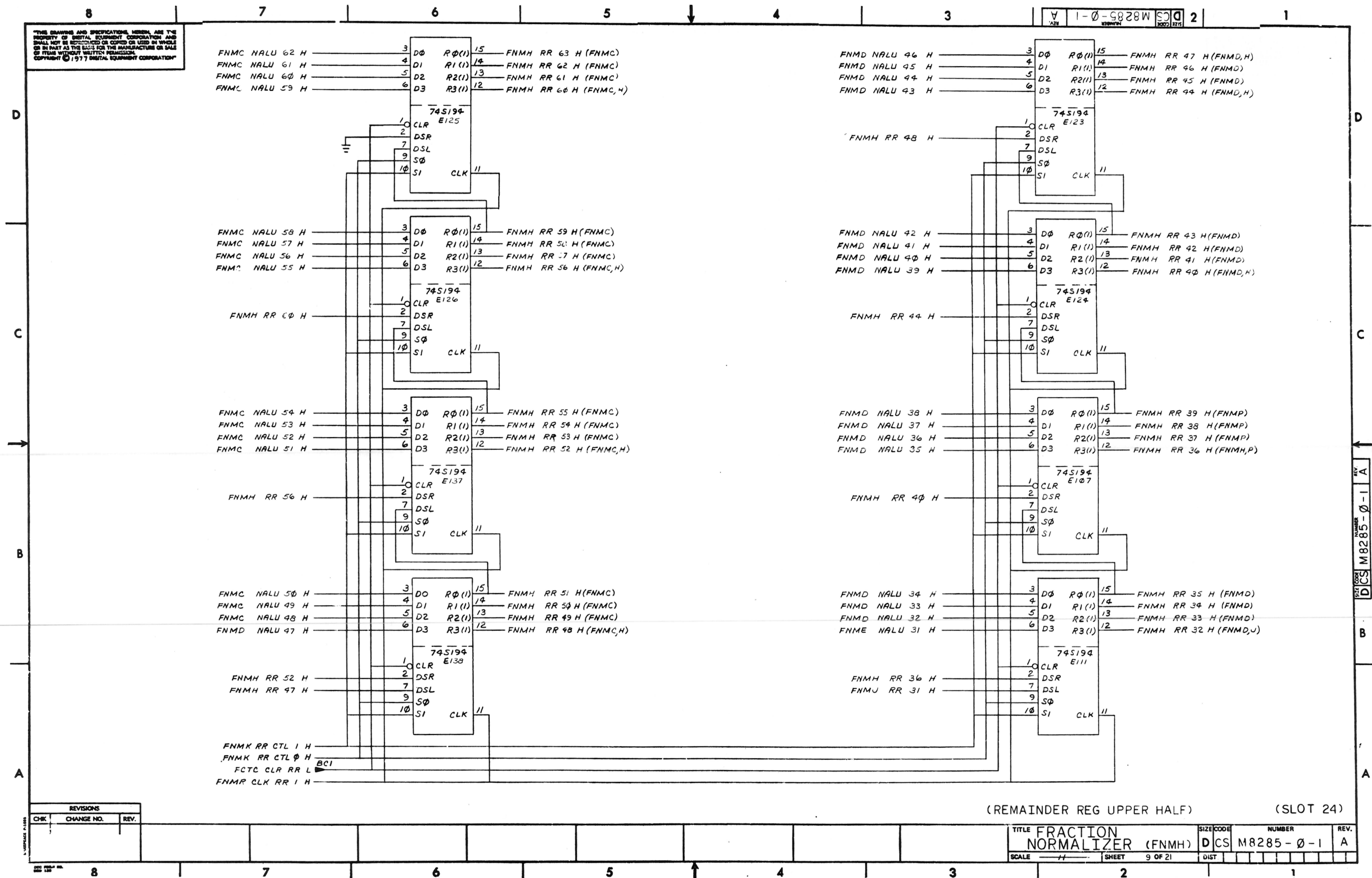
TITLE		SIZE CODE	NUMBER	REV.
FRACTION NORMALIZER (FNME)		D	M8285-0-1	A
SCALE	SHEET	DIST.	7 OF 21	

THIS DRAWING AND SPECIFICATIONS HEREIN ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION. COPYRIGHT © 1977 DIGITAL EQUIPMENT CORPORATION

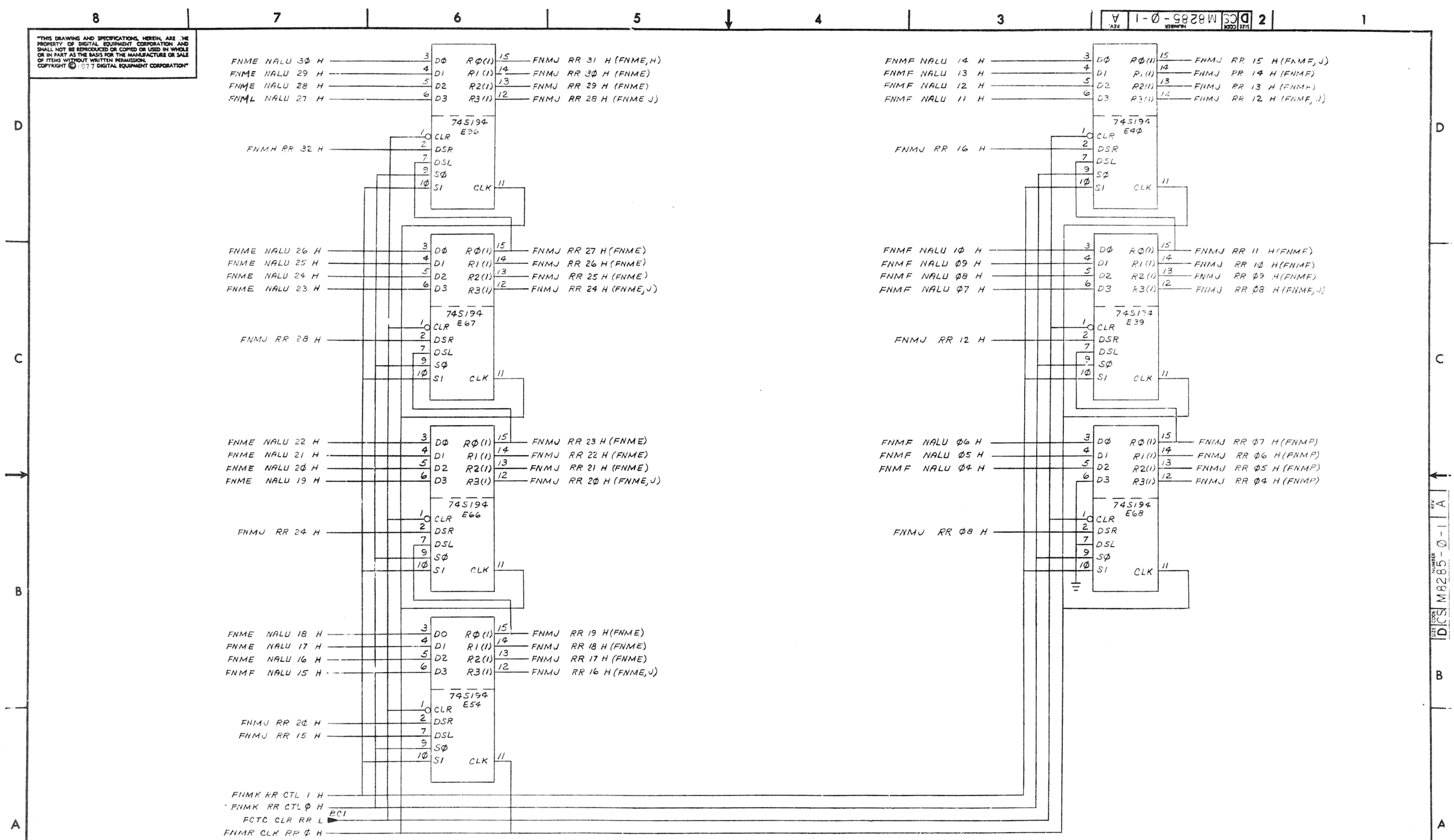


REVISIONS		
CHK	CHANGE NO.	REV.

TITLE FRACTION NORMALIZER (FNM)		SIZE CODE DCS	NUMBER M8285-0-1	REV. A
SCALE	SHEET 8 OF 21	DIST.		



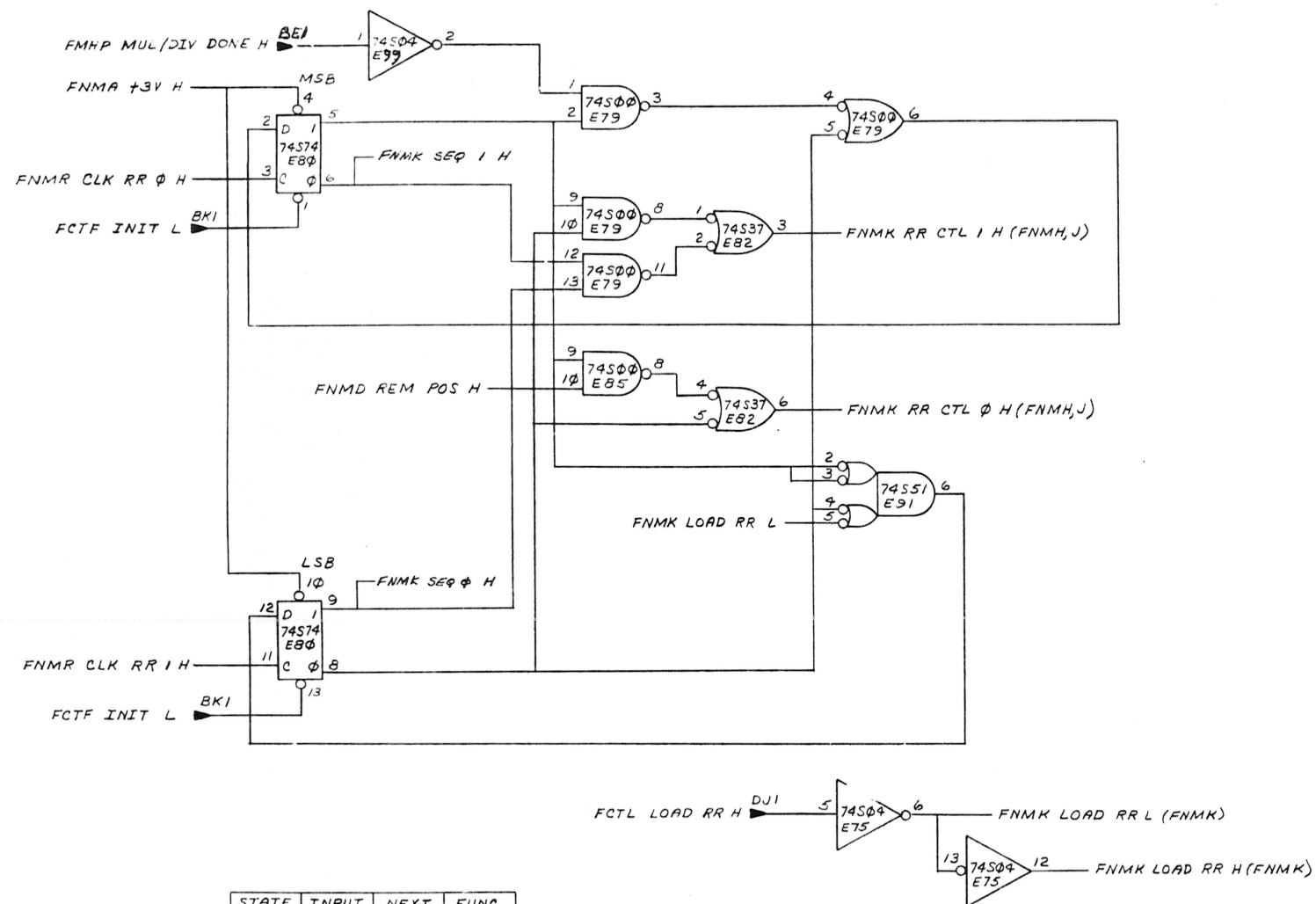
THIS DRAWING AND SPECIFICATIONS HEREIN ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION. COPYRIGHT © 1977 DIGITAL EQUIPMENT CORPORATION



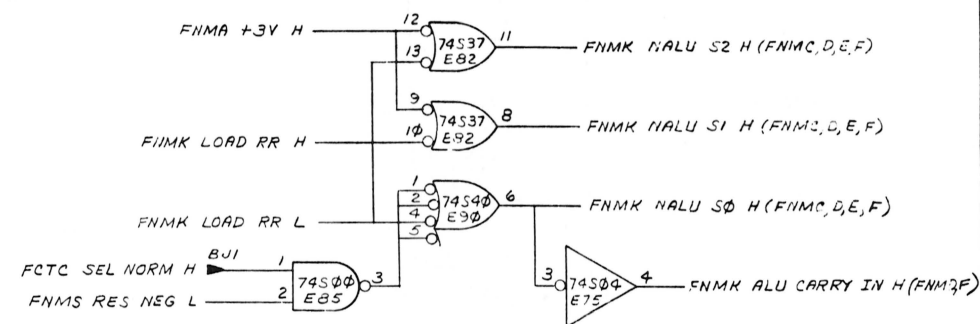
REVISIONS		
CHK	CHANGE NO.	REV.

(REMAINDER REG LOWER HALF)		(SLOT 24)	
TITLE FRACTION NORMALIZER (FNMJ)		SIZE COG. DCS	NUMBER M8285-0-1
SCALE 1/1	SHEET 10 OF 21	DIST.	REV. A

THIS DRAWING AND SPECIFICATIONS, HEREIN, ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION.
COPYRIGHT © 1977 DIGITAL EQUIPMENT CORPORATION



STATE	INPUT	NEXT	FUNC
Φ Φ	LD RR	Φ Φ	TOP
Φ Φ	LD RR	Φ I	TOP
Φ I	X	I I	LOAD
I I	X	I Φ	SHR
I Φ	DONE	I Φ	LD/SHL
I Φ	DONE	Φ Φ	LD/SHL



ALU CONTROL				
MICROCODE	ALU	S2	S1	S0
LOAD RR	A OR B	1	Φ	1
BMX NORM	A ± B	0	1	①
DIVIDE	A - 3	0	1	0

① SELECTED BY HARDWARE

REV. A
NUMBER M8285-0-1
SIZE CODE DCS

B

A

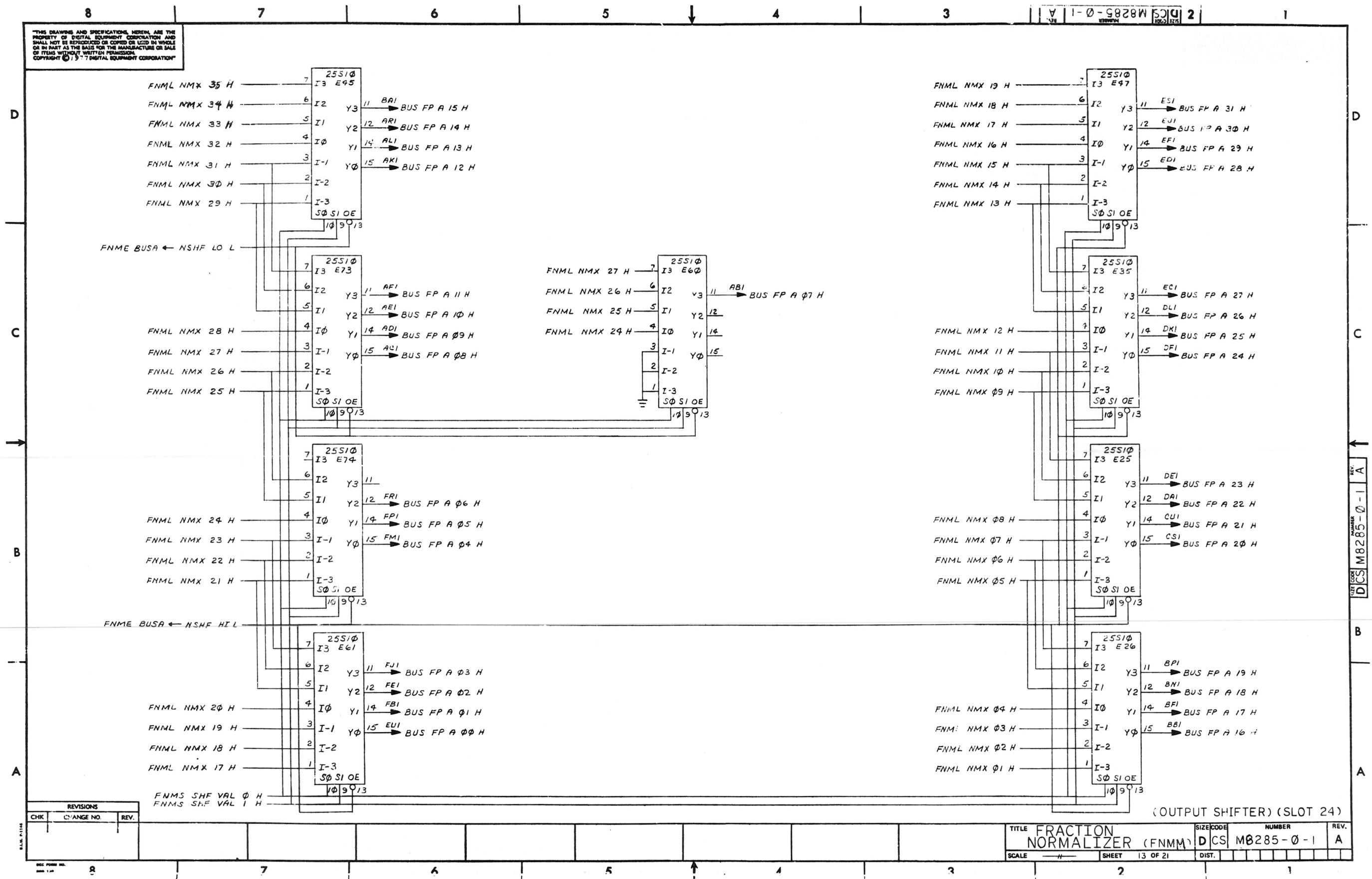
REVISIONS		
CHK	CHANGE NO.	REV.

(RR & NALU OP CTL)

(SLOT 24)

TITLE	FRACTION NORMALIZER (FNMK)	SIZE CODE	DCS	NUMBER	M8285-0-1	REV.	A
SCALE	11	SHEET	11	OF 21	DIST.		

[illegible]



"THIS DRAWING AND SPECIFICATIONS, HEREIN, ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION. COPYRIGHT © 1977 DIGITAL EQUIPMENT CORPORATION"

1-0-0828W SC 2

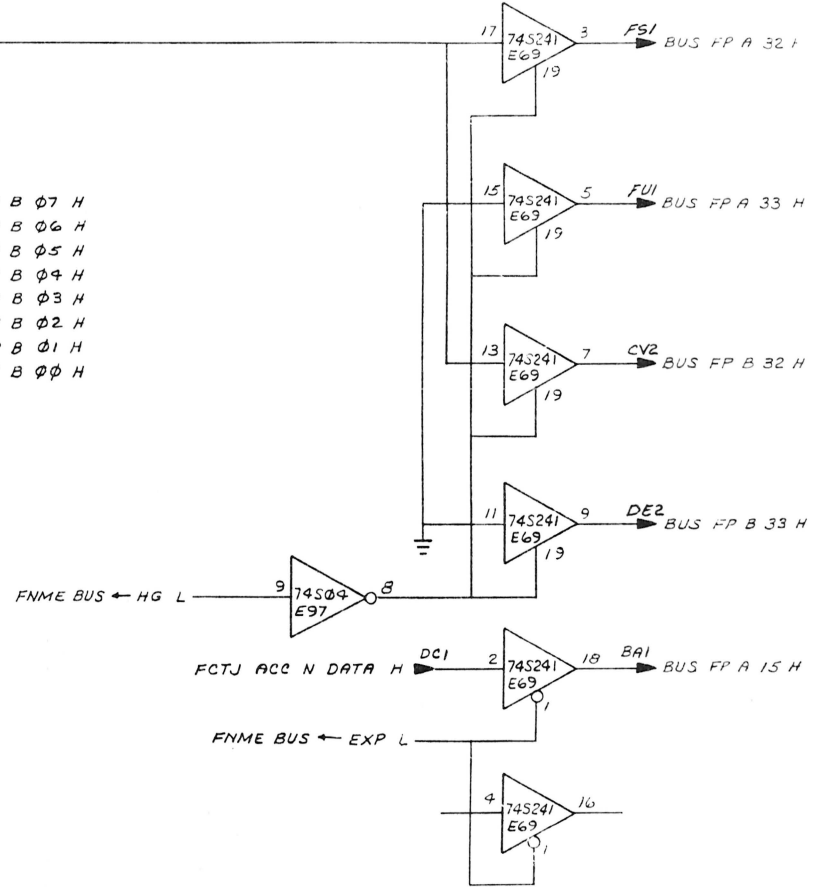
BUS FP A 31 H ESI 3 74S373 2 CU2 BUS FP B 31 H
BUS FP A 30 H EJI 4 D0 Q0 5 CP2 BUS FP B 30 H
BUS FP A 29 H FFI 7 D1 Q1 6 BP2 BUS FP B 29 H
BUS FP A 28 H EDI 8 D2 Q2 9 EP2 BUS FP B 28 H
BUS FP A 27 H ECI 17 D3 Q3 10 EE2 BUS FP B 27 H
BUS FP A 26 H DLI 13 D4 Q4 12 BD2 BUS FP B 26 H
BUS FP A 25 H DK1 14 D5 Q5 15 BB2 BUS FP B 25 H
BUS FP A 24 H DFI 18 D7 Q7 19 AV2 BUS FP B 24 H

FNMA +3V H
FNME BUS ← XFER L

BUS FP A 23 H DEI 3 74S373 2 AR2 BUS FP B 23 H
BUS FP A 22 H DAI 4 D0 Q0 5 AM2 BUS FP B 22 H
BUS FP A 21 H CUI 7 D1 Q1 6 AL2 BUS FP B 21 H
BUS FP A 20 H CSI 8 D2 Q2 9 AK2 BUS FP B 20 H
BUS FP A 19 H BPI 17 D3 Q3 10 AU2 BUS FP B 19 H
BUS FP A 18 H BNI 13 D4 Q4 12 AE2 BUS FP B 18 H
BUS FP A 17 H BFI 14 D5 Q5 15 AD2 BUS FP B 17 H
BUS FP A 16 H BBI 18 D7 Q7 19 AB2 BUS FP B 16 H

BUS FP A 15 H BAI 3 74S373 2 FU2 BUS FP B 15 H
BUS FP A 14 H ARI 4 D0 Q0 5 FS2 BUS FP B 14 H
BUS FP A 13 H ALI 7 D1 Q1 6 FR2 BUS FP B 13 H
BUS FP A 12 H AKI 8 D2 Q2 9 FP2 BUS FP B 12 H
BUS FP A 11 H AFI 17 D3 Q3 10 FM2 BUS FP B 11 H
BUS FP A 10 H AEI 13 D4 Q4 12 FJ2 BUS FP B 10 H
BUS FP A 09 H ADI 14 D5 Q5 15 FF2 BUS FP B 09 H
BUS FP A 08 H ACI 18 D7 Q7 19 FB2 BUS FP B 08 H

BUS FP A 07 H ABI 3 74S373 2 EU2 BUS FP B 07 H
BUS FP A 06 H FRI 4 D0 Q0 5 ES2 BUS FP B 06 H
BUS FP A 05 H FPI 7 D1 Q1 6 EJ2 BUS FP B 05 H
BUS FP A 04 H FMI 8 D2 Q2 9 EF2 BUS FP B 04 H
BUS FP A 03 H FJI 17 D3 Q3 10 ED2 BUS FP B 03 H
BUS FP A 02 H FFI 13 D4 Q4 12 DL2 BUS FP B 02 H
BUS FP A 01 H FBI 14 D5 Q5 15 DK2 BUS FP B 01 H
BUS FP A 00 H EUI 18 D7 Q7 19 DF2 BUS FP B 00 H

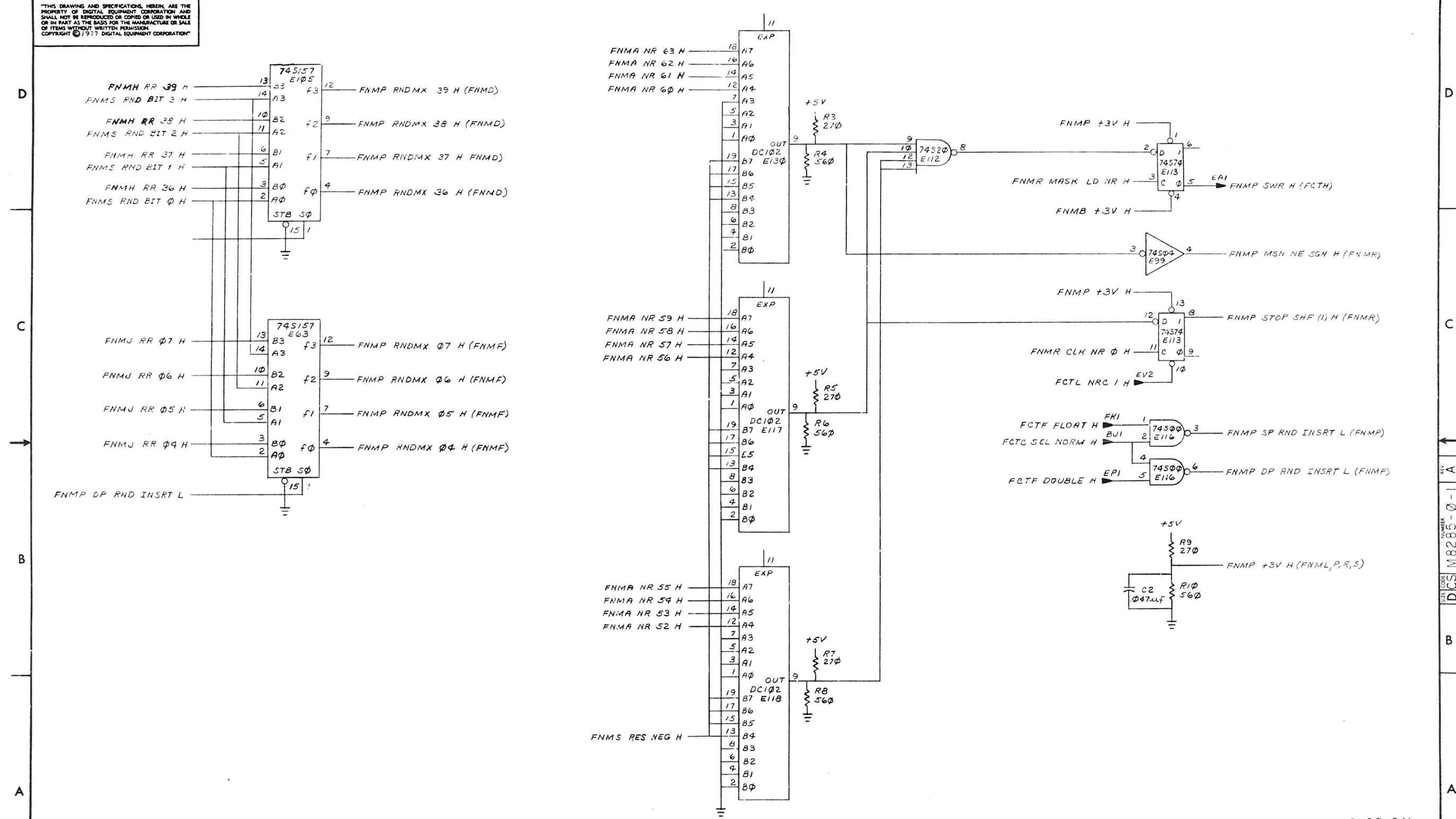


REVISIONS		
CHK	CHANGE NO.	REV.

(BUX XFER) (SLOT 24)

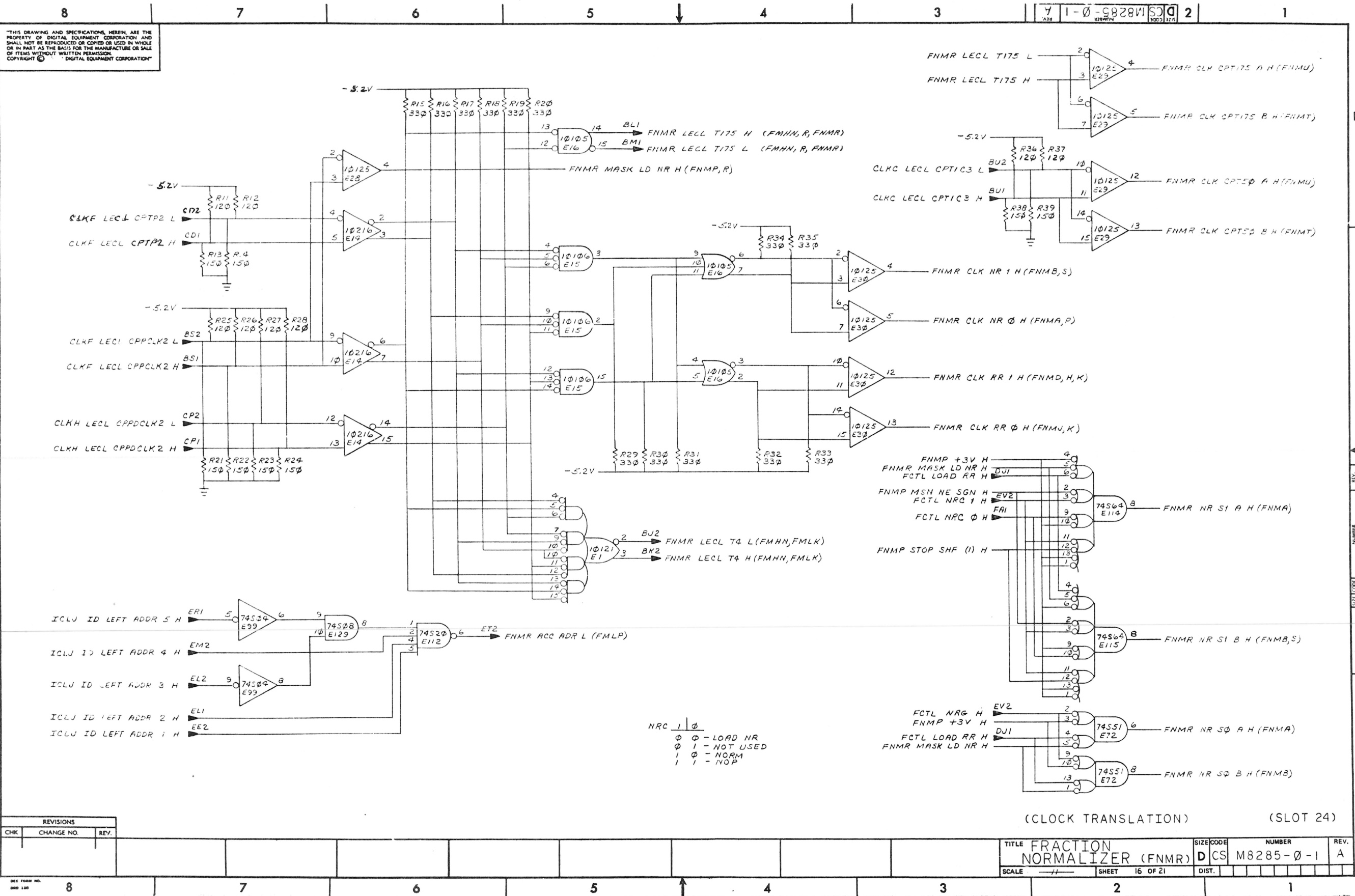
TITLE	FRACTION NORMALIZER (FNMN)	SIZE CODE	DCS	NUMBER	M8285-0-1	REV.	A
SCALE	1/4	SHEET	14 OF 21	DIST.			

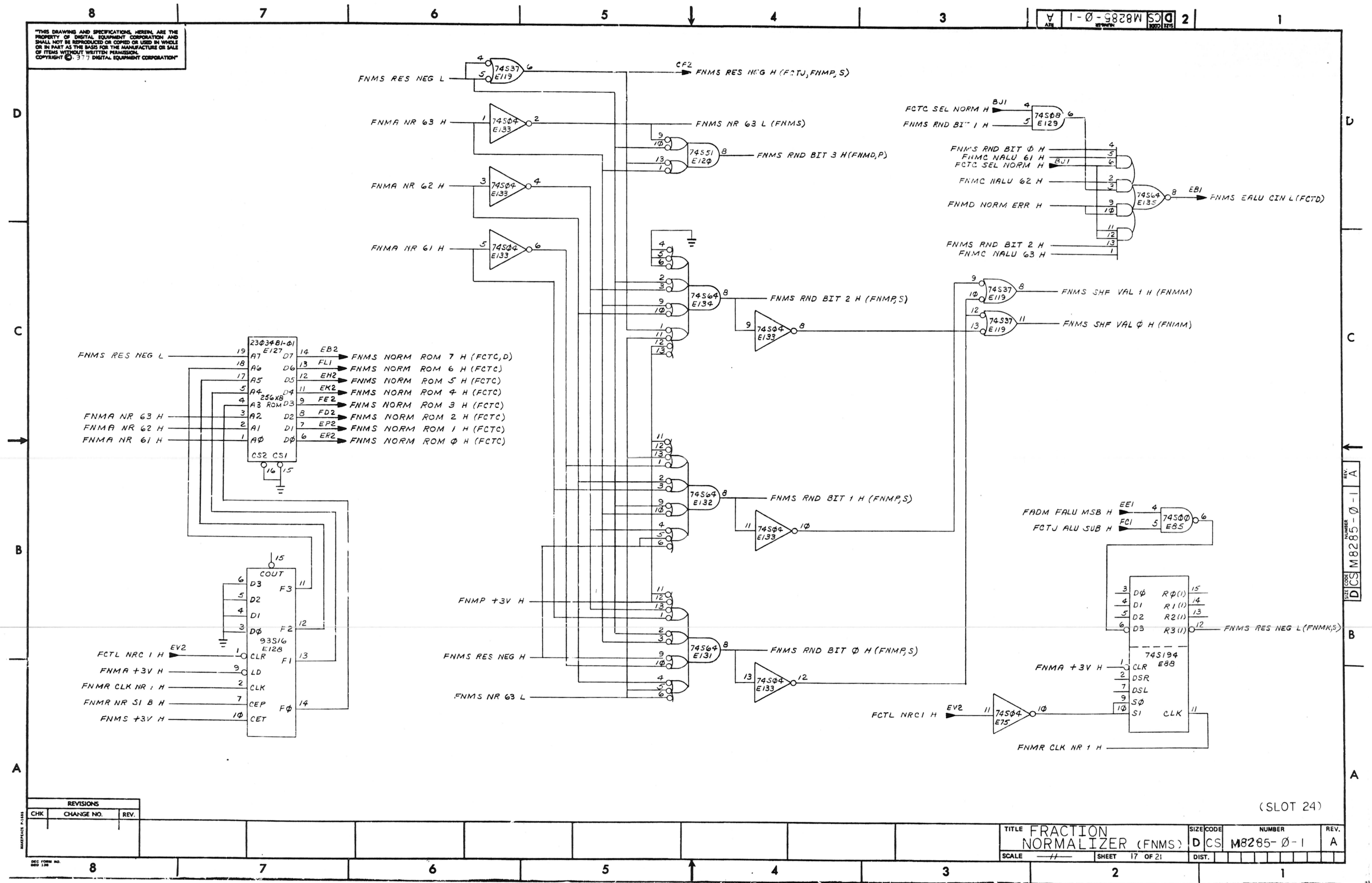
"THIS DRAWING AND SPECIFICATIONS HEREIN ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION.
COPYRIGHT © 1977 DIGITAL EQUIPMENT CORPORATION"



REVISIONS		
CHK	CHANGE NO.	REV.

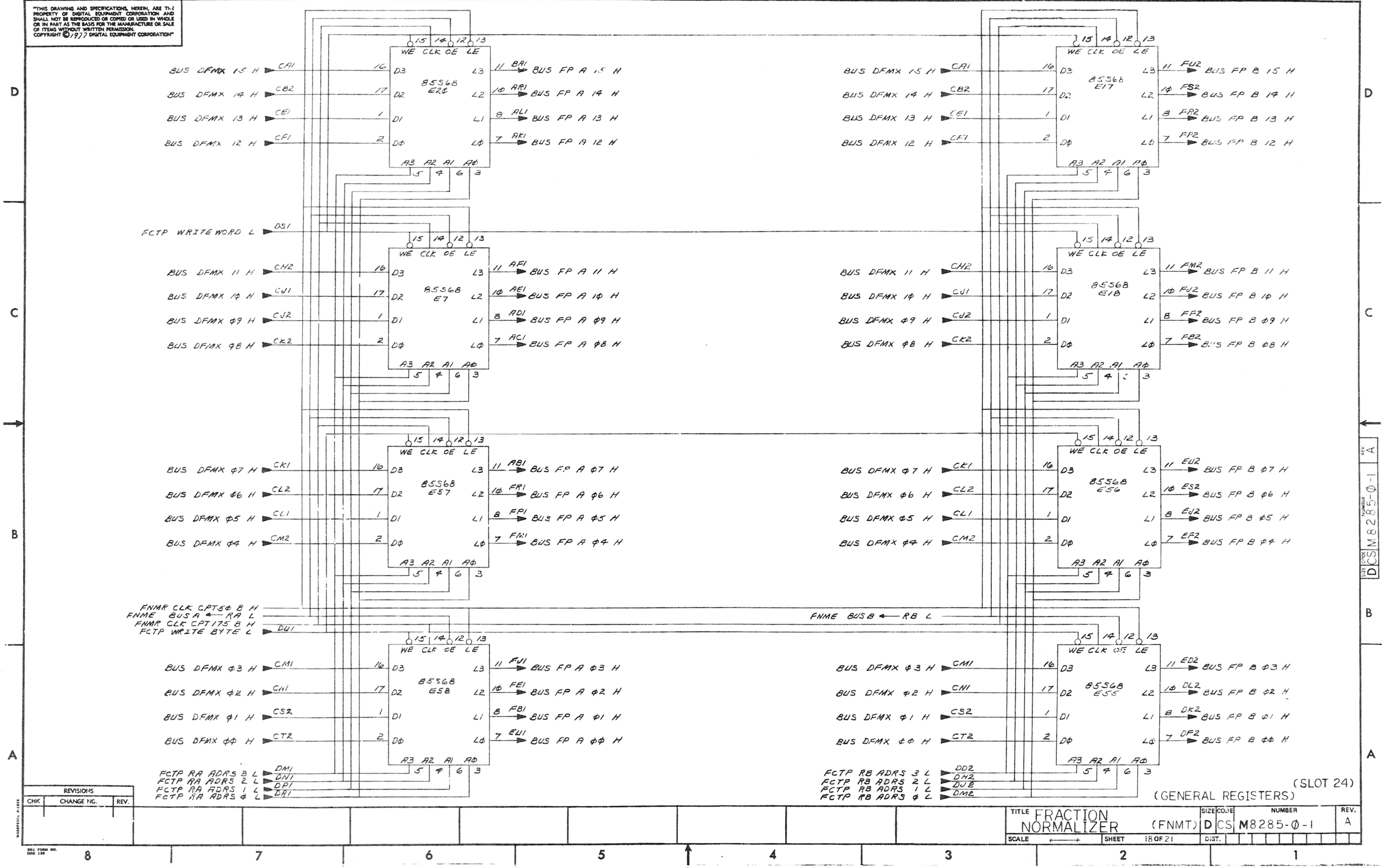
(SLOT 24)





"THIS DRAWING AND SPECIFICATIONS HEREIN ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION. COPYRIGHT © 1977 DIGITAL EQUIPMENT CORPORATION"

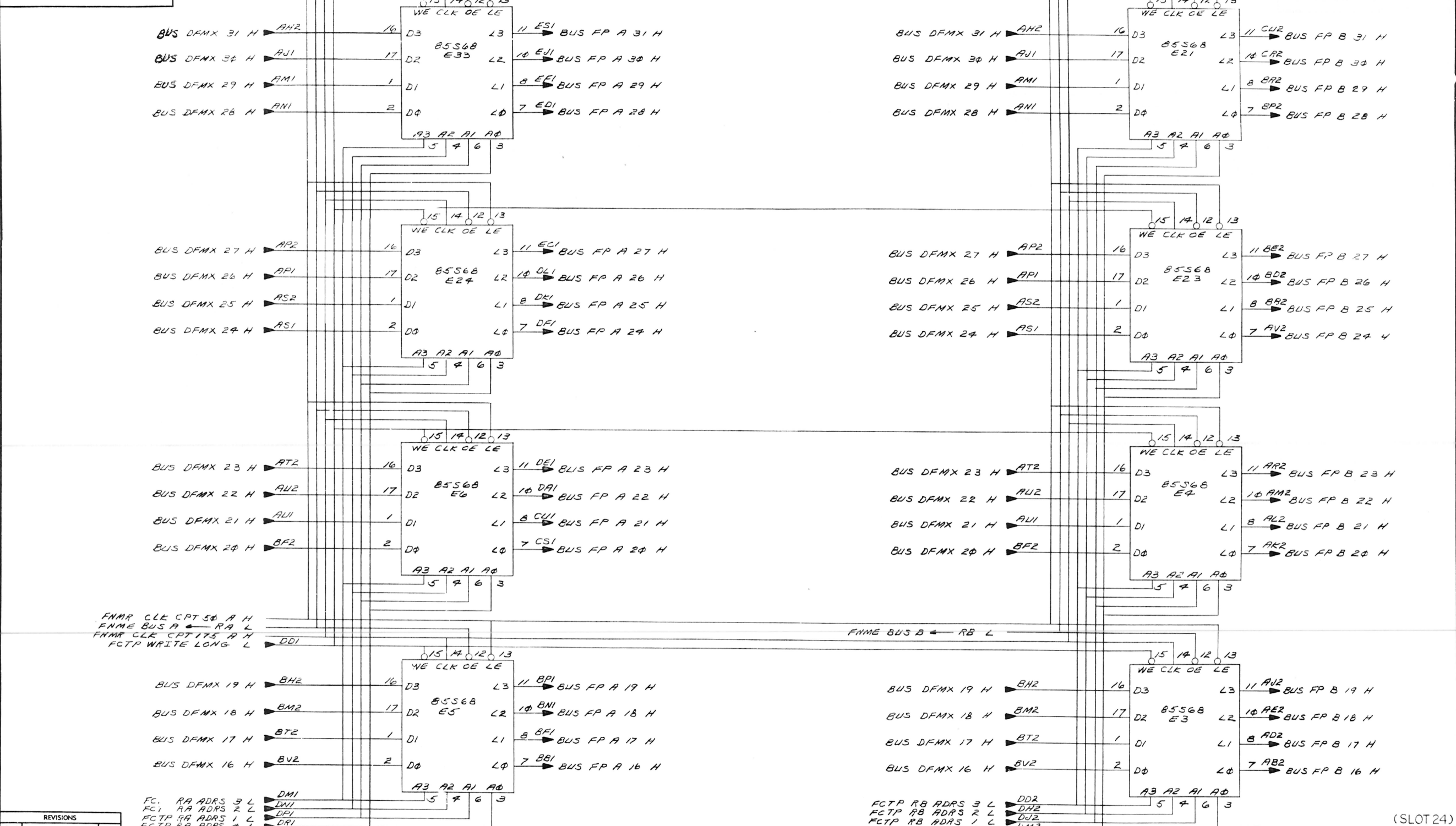
V 1-0-5828W CS D 2



REVISIONS		
CHK	CHANGE NO.	REV.

TITLE		FRACTION NORMALIZER (FNMT)		SIZE CODE	NUMBER	REV.
SCALE		SHEET 18 OF 21		DIST.	CS M8285-0-1	A

"THIS DRAWING AND SPECIFICATIONS, HEREIN, ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION. COPYRIGHT © 1977 DIGITAL EQUIPMENT CORPORATION"



REVISIONS			TITLE		SIZE CODE		NUMBER		REV.	
CHK	CHANGE NO.	REV.	FRACTION NORMALIZER (FNMU)		DCS		M8285-0-1		A	
			SCALE		SHEET		19 OF 21		DIST.	

"THIS DRAWING AND SPECIFICATIONS, HEREIN, ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION.
DIGITAL EQUIPMENT CORPORATION"
COPYRIGHT ©

NORMALIZATION ROM CONSTANTS

PROM DATA							
PROM ADDR	7	6	5	4	3	2	1 0
00	L	L	L	L	L	L	L
01	L	L	L	L	L	L	L
02	L	L	L	L	L	L	L
03	L	L	L	L	L	L	L
04	L	L	L	L	L	L	L
05	L	L	L	L	L	L	L
06	H	H	H	H	H	H	H
07	H	H	H	H	H	H	L
08	H	H	H	H	H	L	H
09	H	H	H	H	L	H	H
0A	H	H	H	H	L	H	H
0B	H	H	H	H	L	H	H
0C	H	H	H	H	L	L	L
0D	H	H	H	H	L	L	L
0E	H	H	H	H	L	L	H
0F	H	H	H	H	L	L	L
10	H	H	H	H	L	L	H
11	H	H	H	H	L	L	H
12	H	H	H	H	L	L	H
13	H	H	H	H	L	L	H
14	H	H	H	H	L	L	L
15	H	H	H	H	L	L	L
16	H	H	H	H	L	L	H
17	H	H	H	H	L	L	H
18	H	H	H	H	L	L	H
19	H	H	H	H	L	L	H
1A	H	H	H	H	L	L	H
1B	H	H	H	H	L	L	H
1C	H	H	H	H	L	L	L
1D	H	H	H	H	L	L	L
1E	H	H	H	H	L	L	H
1F	H	H	H	H	L	L	L
20	H	H	H	H	L	L	H
21	H	H	H	H	L	L	H
22	H	H	H	H	L	L	H
23	H	H	H	H	L	L	H
24	H	H	H	H	L	L	L
25	H	H	H	H	L	L	L
26	H	H	H	H	L	L	H
27	H	H	H	H	L	L	L
28	H	H	H	H	L	L	H
29	H	H	H	H	L	L	H
2A	H	H	H	H	L	L	H

PROM DATA							
PROM ADDR	7	6	5	4	3	2	1 0
2B	H	H	H	L	H	H	L
2C	H	H	H	L	H	H	L
2D	H	H	H	L	H	H	L
2E	H	H	H	L	H	L	H
2F	H	H	H	L	H	L	H
30	H	H	H	L	H	L	H
31	H	H	H	L	H	L	H
32	H	H	H	L	H	L	H
33	H	H	H	L	H	L	H
34	H	H	H	L	H	L	L
35	H	H	H	L	H	L	L
36	H	H	H	L	H	L	H
37	H	H	H	L	H	L	H
38	H	H	H	L	H	L	H
39	H	H	H	L	H	L	H
3A	H	H	H	L	H	L	H
3B	H	H	H	L	H	L	H
3C	H	H	H	L	H	L	L
3D	H	H	H	L	H	L	L
3E	H	H	H	L	H	L	H
3F	H	H	H	L	H	L	L
40	H	H	H	L	H	L	H
41	H	H	H	L	H	L	H
42	H	H	H	L	H	L	H
43	H	H	H	L	H	L	L
44	H	H	H	L	H	L	L
45	H	H	H	L	H	L	L
46	H	H	H	L	H	L	H
47	H	H	H	L	H	L	H
48	H	H	H	L	H	L	H
49	H	H	H	L	H	L	H
4A	H	H	H	L	H	L	H
4B	H	H	H	L	H	L	H
4C	H	H	H	L	H	L	L
4D	H	H	H	L	H	L	L
4E	H	H	H	L	H	L	H
4F	H	H	H	L	H	L	L
50	H	H	H	L	H	L	H
51	H	H	H	L	H	L	H
52	H	H	H	L	H	L	H
53	H	H	H	L	H	L	H
54	H	H	H	L	H	L	L
55	H	H	H	L	H	L	L

PROM DATA							
PROM ADDR	7	6	5	4	3	2	1 0
56	H	H	L	H	L	H	H
57	H	H	L	H	L	H	L
58	H	H	L	H	L	H	L
59	H	H	L	H	L	H	L
5A	H	H	L	H	L	H	L
5B	H	H	L	H	L	H	L
5C	H	H	L	H	L	H	L
5D	H	H	L	H	L	H	L
5E	H	H	L	H	L	H	H
5F	H	H	L	H	L	H	L
60	H	H	L	H	L	L	L
61	H	H	L	H	L	L	L
62	H	H	L	H	L	L	L
63	H	H	L	H	L	L	L
64	H	H	L	H	L	L	L
65	H	H	L	H	L	L	L
66	H	H	L	H	L	L	H
67	H	H	L	H	L	L	L
68	H	H	L	H	L	L	L
69	H	H	L	H	L	L	L
6A	H	H	L	H	L	L	L
6B	H	H	L	H	L	L	L
6C	H	H	L	H	L	L	L
6D	H	H	L	H	L	L	L
6E	H	H	L	H	L	L	L
6F	H	H	L	H	L	L	L
70	H	H	L	H	L	L	L
71	H	H	L	H	L	L	L
72	H	H	L	H	L	L	L
73	H	H	L	H	L	L	L
74	H	H	L	H	L	L	L
75	H	H	L	H	L	L	L
76	H	H	L	H	L	L	L
77	H	H	L	H	L	L	L
78	H	H	L	H	L	L	L
79	H	H	L	H	L	L	L
7A	H	H	L	H	L	L	L
7B	H	H	L	H	L	L	L
7C	H	H	L	H	L	L	L
7D	H	H	L	H	L	L	L
7E	H	H	L	H	L	L	L
7F	H	H	L	H	L	L	L
80	H	H	L	H	L	L	L

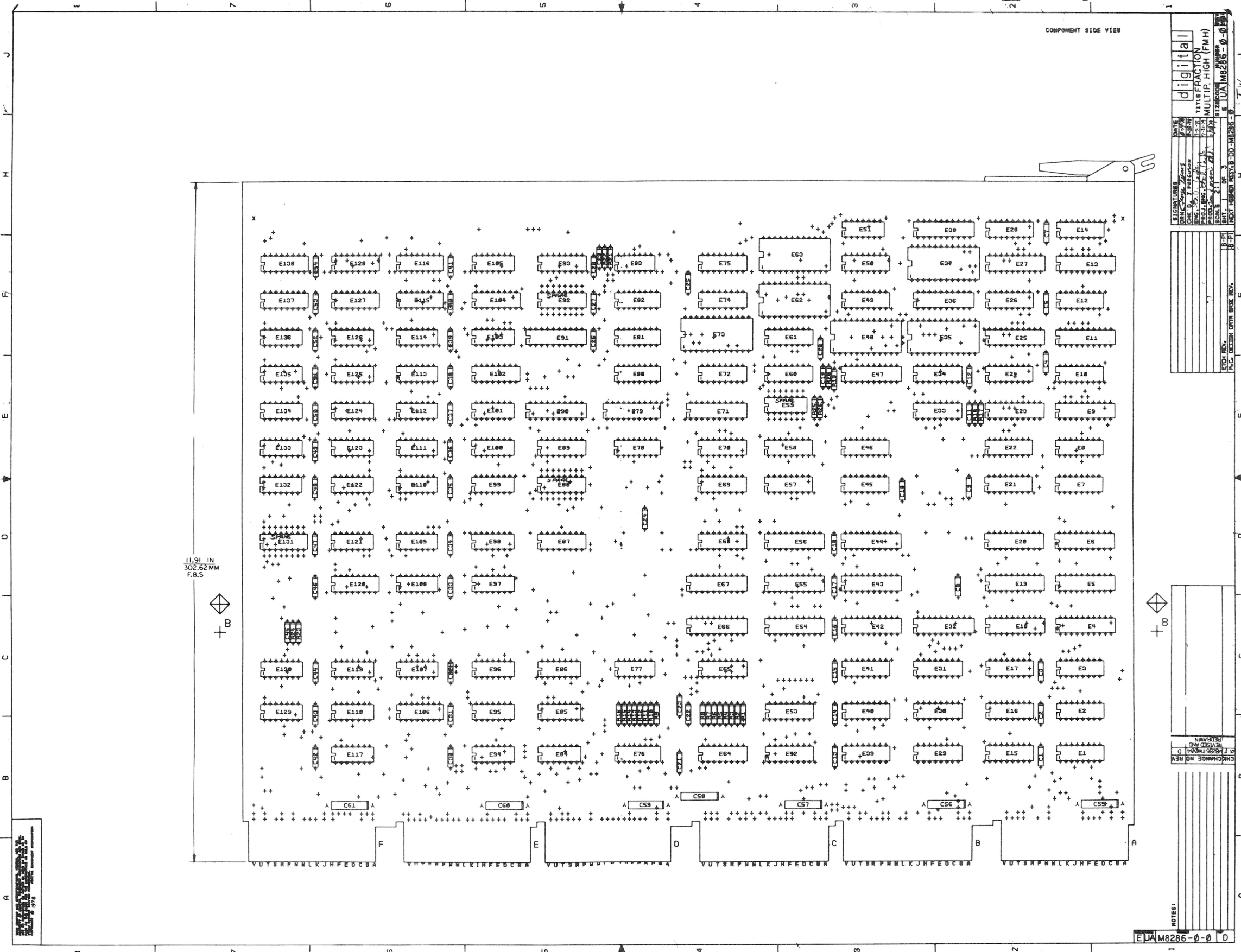
PROM DATA							
PROM ADDR	7	6	5	4	3	2	1 0
81	H	H	L	H	L	H	H
82	L	L	L	L	L	L	L
83	L	L	L	L	L	L	L
84	L	L	L	L	L	L	H
85	L	L	L	L	L	L	L
86	L	L	L	L	L	L	L
87	L	L	L	L	L	L	L
88	H	H	H	H	L	H	L
89	H	H	H	H	L	H	H
8A	H	H	H	H	L	L	L
8B	H	H	H	H	L	L	L
8C	H	H	H	H	L	L	L
8D	H	H	H	H	L	L	L
8E	H	H	H	H	L	L	L
8F	H	H	H	H	L	L	L
90	H	H	H	H	L	L	L
91	H	H	H	H	L	L	H
92	H	H	H	H	L	L	L
93	H	H	H	H	L	L	L
94	H	H	H	H	L	L	L
95	H	H	H	H	L	L	L
96	H	H	H	H	L	L	L
97	H	H	H	H	L	L	L
98	H	H	H	H	L	L	L
99	H	H	H	H	L	L	L
9A	H	H	H	H	L	L	L
9B	H	H	H	H	L	L	L
9C	H	H	H	H	L	L	L
9D	H	H	H	H	L	L	L
9E	H	H	H	H	L	L	L
9F	H	H	H	H	L	L	L
AA	H	H	H	L	L	L	L
AB	H	H	H	L	L	L	L
AC	H	H	H	L	L	L	L
AD	H	H	H	L	L	L	L
AE	H	H	H	L	L	L	L
AF	H	H	H	L	L	L	L
B0	H	H	H	L	L	L	L
B1	H	H	H	L	L	L	L
B2	H	H	H	L	L	L	L
B3	H	H	H	L	L	L	L
B4	H	H	H	L	L	L	L
B5	H	H	H	L	L	L	L
B6	H	H	H	L	L	L	L
B7	H	H	H	L	L	L	L
B8	H	H	H	L	L	L	L
B9	H	H	H	L	L	L	L
BA	H	H	H	L	L	L	L
BB	H	H	H	L	L	L	L
BC	H	H	H	L	L	L	L
BD	H	H	H	L	L	L	L
BE	H	H	H	L	L	L	L
BF	H	H	H	L	L	L	L
C0	H	H	L	H	H	H	L
C1	H	H	L	H	H	H	L
C2	H	H	L	H	H	L	L
C3	H	H	L	H	H	L	L
C4	H	H	L	H	H	L	L
C5	H	H	L	H	H	L	L
C6	H	H	L	H	H	L	L
C7	H	H	L	H	H	L	L
C8	H	H	L	H	H	L	L
C9	H	H	L	H	H	L	L
CA	H	H	L	H	H	L	L
CB	H	H	L	H	H	L	L
CC	H	H	L	H	H	L	L
CD	H	H	L	H	H	L	L
CE	H	H	L	H	H	L	L
CF	H	H	L	H	H	L	L
D0	H	H	L	H	H	L	L
D1	H	H	L	H	H	L	L
D2	H	H	L	H	H	L	L
D3	H	H	L	H	H	L	L
D4	H	H	L	H	H	L	L
D5	H	H	L	H	H	L	L
D6	H	H	L	H	H	L	L

PROM DATA							
PROM ADDR	7	6	5	4	3	2	1 0
D7	H	H	L	H	L	L	H
D8	H	H	L	H	L	L	L
D9	H	H	L	H	L	L	H
DA	H	H	L	H	L	L	L
DB	H	H	L	H	L	L	L
DC	H	H	L	H	L	L	H
DD	H	H	L	H	L	L	H
DE	H	H	L	H	L	L	H
DF	H	H	L	H	L	L	H
E0	H	H	L	H	L	L	L
E1	H	H	L	H	L	L	L
E2	H	H	L	H	L	L	L
E3	H	H	L	H	L	L	L
E4	H	H	L	H	L	L	L
E5	H	H	L	H	L	L	L
E6	H	H	L	H	L	L	L
E7	H	H	L	H	L	L	L
E8	H	H	L	H	L	L	L
E9	H	H	L	H	L	L	L
EA	H	H	L	H	L	L	L
EB	H	H	L	H	L	L	L
EC	H	H	L	H	L	L	L
ED	H	H	L	H	L	L	L
EE	H	H	L	H	L	L	L
EF	H	H	L	H	L	L	L
FO	H	H	L	H	L	L	L
F1	H	H	L	H	L	L	L
F2	H	H	L	H	L	L	L
F3	H	H	L	H	L	L	L
F4	H	H	L	H	L	L	L
F5	H	H	L	H	L	L	L
F6	H	H	L	H	L	L	L
F7	H	H	L	H	L	L	L
F8	H	H	L	H	L	L	L
F9	H	H	L	H	L	L	L
FA	H	H	L	H	L	L	L
FB	H	H	L	H	L	L	L
FC	H	H	L	H	L	L	L
FD	H	H	L	H	L	L	L
FE	H	H	L	H	L	L	L
FF	H	H	L	H	L	L	L

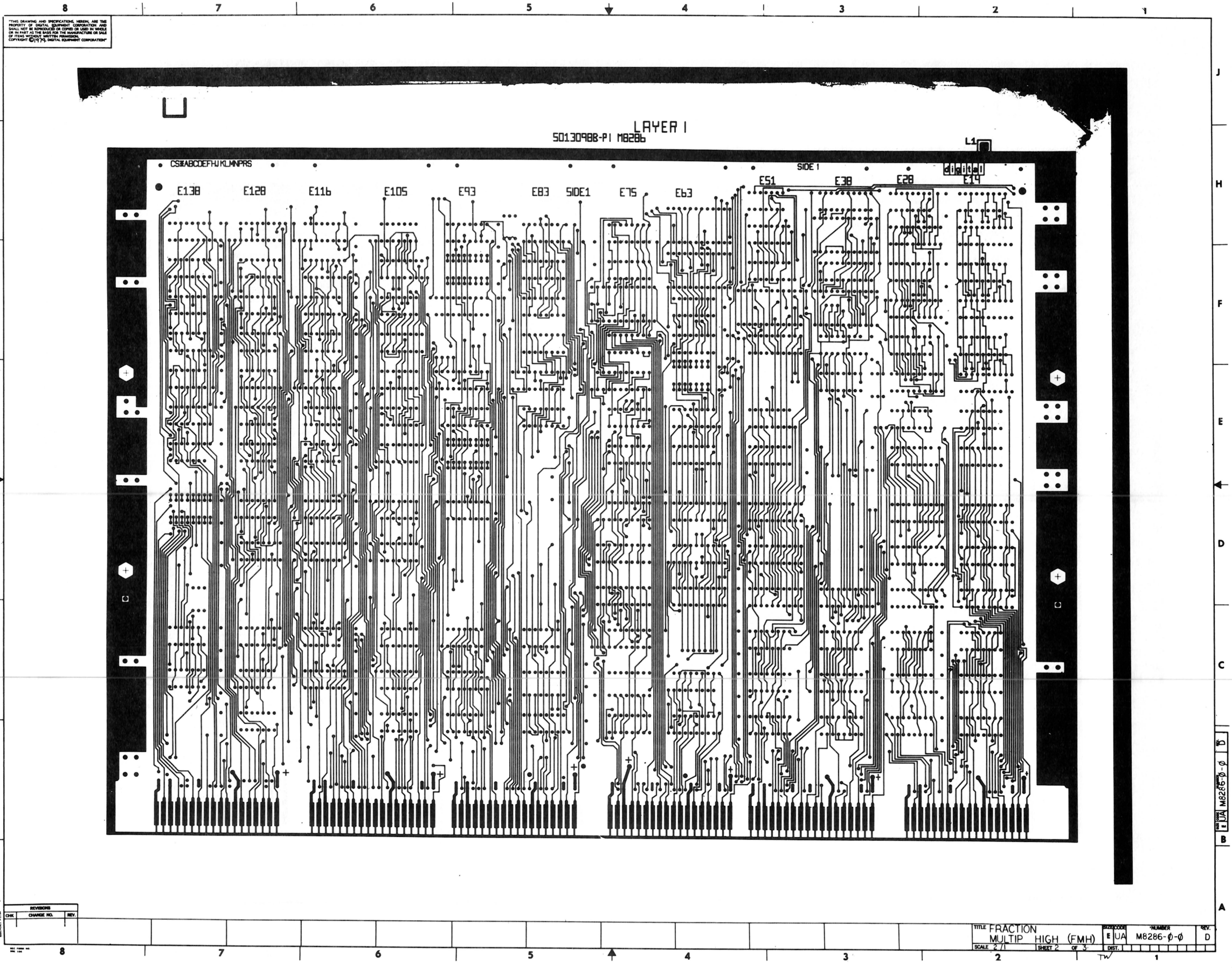
NORM ROM
CONSTANTS
(23-034BI-01)

(SLOT 24)

DRN.		FIRST USED ON	digital
CHK'D		TITLE	FRACTION NORMALIZER (FNM)
ENG.		PROJ. ENG.	
PROD.		PROD.	
NEXT HIGHER ASSY.		</	

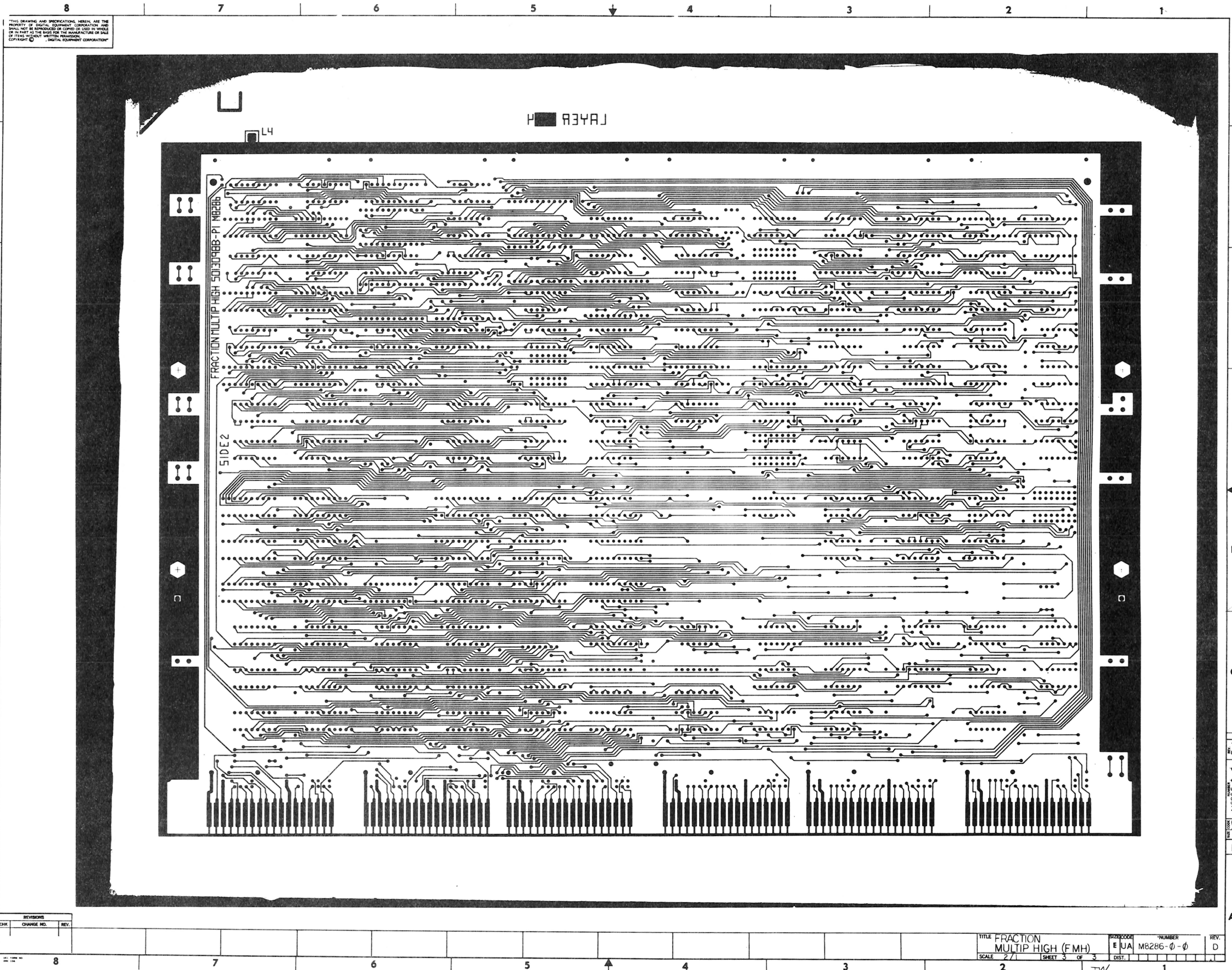


digital	
TITLE: FRACTION	
MULTIPLIER: HIGH (FMH)	
EIA M8286-0-0	
DATE: 1/1/77	
BY: J. A. M. 8286-0-0	
CHECKED: J. A. M. 8286-0-0	
APPROVED: J. A. M. 8286-0-0	
SCALE: 1/1	
SHEET: 1 OF 1	
REV: 1	
REV: 2	
REV: 3	
REV: 4	
REV: 5	
REV: 6	
REV: 7	
REV: 8	
REV: 9	
REV: 10	
REV: 11	
REV: 12	
REV: 13	
REV: 14	
REV: 15	
REV: 16	
REV: 17	
REV: 18	
REV: 19	
REV: 20	
REV: 21	
REV: 22	
REV: 23	
REV: 24	
REV: 25	
REV: 26	
REV: 27	
REV: 28	
REV: 29	
REV: 30	
REV: 31	
REV: 32	
REV: 33	
REV: 34	
REV: 35	
REV: 36	
REV: 37	
REV: 38	
REV: 39	
REV: 40	
REV: 41	
REV: 42	
REV: 43	
REV: 44	
REV: 45	
REV: 46	
REV: 47	
REV: 48	
REV: 49	
REV: 50	
REV: 51	
REV: 52	
REV: 53	
REV: 54	
REV: 55	
REV: 56	
REV: 57	
REV: 58	
REV: 59	
REV: 60	
REV: 61	
REV: 62	
REV: 63	
REV: 64	
REV: 65	
REV: 66	
REV: 67	
REV: 68	
REV: 69	
REV: 70	
REV: 71	
REV: 72	
REV: 73	
REV: 74	
REV: 75	
REV: 76	
REV: 77	
REV: 78	
REV: 79	
REV: 80	
REV: 81	
REV: 82	
REV: 83	
REV: 84	
REV: 85	
REV: 86	
REV: 87	
REV: 88	
REV: 89	
REV: 90	
REV: 91	
REV: 92	
REV: 93	
REV: 94	
REV: 95	
REV: 96	
REV: 97	
REV: 98	
REV: 99	
REV: 100	
REV: 101	
REV: 102	
REV: 103	
REV: 104	
REV: 105	
REV: 106	
REV: 107	
REV: 108	
REV: 109	
REV: 110	
REV: 111	
REV: 112	
REV: 113	
REV: 114	
REV: 115	
REV: 116	
REV: 117	
REV: 118	
REV: 119	
REV: 120	
REV: 121	
REV: 122	
REV: 123	
REV: 124	
REV: 125	
REV: 126	
REV: 127	
REV: 128	
REV: 129	
REV: 130	
REV: 131	
REV: 132	
REV: 133	
REV: 134	
REV: 135	
REV: 136	
REV: 137	
REV: 138	
REV: 139	
REV: 140	
REV: 141	
REV: 142	
REV: 143	
REV: 144	
REV: 145	
REV: 146	
REV: 147	
REV: 148	
REV: 149	
REV: 150	
REV: 151	
REV: 152	
REV: 153	
REV: 154	
REV: 155	
REV: 156	
REV: 157	
REV: 158	
REV: 159	
REV: 160	
REV: 161	
REV: 162	
REV: 163	
REV: 164	
REV: 165	
REV: 166	
REV: 167	
REV: 168	
REV: 169	
REV: 170	
REV: 171	
REV: 172	
REV: 173	
REV: 174	
REV: 175	
REV: 176	
REV: 177	
REV: 178	
REV: 179	
REV: 180	
REV: 181	
REV: 182	
REV: 183	
REV: 184	
REV: 185	
REV: 186	
REV: 187	
REV: 188	
REV: 189	
REV: 190	
REV: 191	
REV: 192	
REV: 193	
REV: 194	
REV: 195	
REV: 196	
REV: 197	
REV: 198	
REV: 199	
REV: 200	
REV: 201	
REV: 202	
REV: 203	
REV: 204	
REV: 205	
REV: 206	
REV: 207	
REV: 208	
REV: 209	
REV: 210	
REV: 211	
REV: 212	
REV: 213	
REV: 214	
REV: 215	
REV: 216	
REV: 217	
REV: 218	
REV: 219	
REV: 220	
REV: 221	
REV: 222	
REV: 223	
REV: 224	
REV: 225	
REV: 226	
REV: 227	
REV: 228	
REV: 229	
REV: 230	
REV: 231	
REV: 232	
REV: 233	
REV: 234	
REV: 235	
REV: 236	
REV: 237	
REV: 238	
REV: 239	
REV: 240	
REV: 241	
REV: 242	
REV: 243	
REV: 244	
REV: 245	
REV: 246	
REV: 247	
REV: 248	
REV: 249	
REV: 250	
REV: 251	
REV: 252	
REV: 253	
REV: 254	
REV: 255	
REV: 256	
REV: 257	
REV: 258	
REV: 259	
REV: 260	
REV: 261	
REV: 262	
REV: 263	
REV: 264	
REV: 265	
REV: 266	
REV: 267	
REV: 268	
REV: 269	
REV: 270	
REV: 271	
REV: 272	
REV: 273	
REV: 274	
REV: 275	
REV: 276	
REV: 277	
REV: 278	
REV: 279	
REV: 280	
REV: 281	
REV: 282	
REV: 283	
REV: 284	
REV: 285	
REV: 286	
REV: 287	
REV: 288	
REV: 289	
REV: 290	
REV: 291	
REV: 292	
REV: 293	
REV: 294	
REV: 295	
REV: 296	
REV: 297	
REV: 298	
REV: 299	
REV: 300	
REV: 301	
REV: 302	
REV: 303	
REV: 304	
REV: 305	
REV: 306	
REV: 307	
REV: 308	
REV: 309	
REV: 310	
REV: 311	
REV: 312	
REV: 313	
REV: 314	
REV: 315	
REV: 316	
REV: 317	
REV: 318	
REV: 319	
REV: 320	
REV: 321	
REV: 322	
REV: 323	
REV: 324	
REV: 325	
REV: 326	
REV: 327	
REV: 328	
REV: 329	
REV: 330	
REV: 331	
REV: 332	
REV: 333	
REV: 334	
REV: 335	
REV: 336	
REV: 337	
REV: 338	
REV: 339	
REV: 340	
REV: 341	
REV: 342	
REV: 343	
REV: 344	
REV: 345	
REV: 346	
REV: 347	
REV: 348	
REV: 349	
REV: 350	
REV: 351	
REV: 352	
REV: 353	
REV: 354	
REV: 355	
REV: 356	
REV: 357	
REV: 358	
REV: 359	
REV: 360	
REV: 361	
REV: 362	
REV: 363	
REV: 364	
REV: 365	
REV: 366	
REV: 367	
REV: 368	
REV: 369	
REV: 370	
REV: 371	
REV: 372	
REV: 373	
REV: 374	
REV: 375	
REV: 376	
REV: 377	
REV: 378	
REV: 379	
REV: 380	
REV: 381	
REV: 382	
REV: 383	
REV: 384	
REV: 385	
REV: 386	
REV: 387	
REV: 388	
REV: 389	
REV: 390	
REV: 391	
REV: 392	
REV: 393	
REV: 394	
REV: 395	
REV: 396	
REV: 397	
REV: 398	
REV: 399	
REV: 400	
REV: 401	
REV: 402	
REV: 403	
REV: 404	
REV: 405	
REV: 406	
REV: 407	
REV: 408	
REV: 409	
REV: 410	
REV: 411	
REV: 412	
REV: 413	
REV: 414	
REV: 415	
REV: 416	
REV: 417	
REV: 418	
REV: 419	
REV: 420	
REV: 421	
REV: 422	
REV: 423	
REV: 424	
REV: 425	
REV: 426	
REV: 427	
REV: 428	
REV: 429	
REV: 430	
REV: 431	
REV: 432	
REV: 433	
REV: 434	
REV: 435	
REV: 436	
REV: 437	
REV: 438	
REV: 439	
REV: 440	
REV: 441	
REV: 442	
REV: 443	
REV: 444	
REV: 445	
REV: 446	
REV: 447	
REV: 448	
REV: 449	
REV: 450	
REV: 451	
REV: 452	
REV: 453	
REV: 454	
REV: 455	
REV: 456	
REV: 457	
REV: 458	
REV: 459	
REV: 460	
REV: 461	
REV: 462	
REV: 463	
REV: 464	
REV: 465	
REV: 466	
REV: 467	
REV: 468	
REV: 469	
REV: 470	
REV: 471	
REV: 472	
REV: 473	
REV: 474	
REV: 475	
REV: 476	
REV: 477	
REV: 478	
REV: 479	
REV: 480	
REV: 481	
REV: 482	
REV: 483	
REV: 484	
REV: 485	
REV: 486	
REV: 487	
REV: 488	
REV: 489	
REV: 490	
REV: 491	
REV: 492	
REV: 493	
REV: 494	
REV: 495	
REV: 496	
REV: 497	
REV: 498	
REV: 499	
REV: 500	
REV: 501	
REV: 502	
REV: 503	
REV: 504	
REV: 505	
REV: 506	
REV: 507	
REV: 508	
REV: 509	
REV: 510	
REV: 511	
REV: 512	
REV: 513	
REV: 514	
REV: 515	
REV: 516	
REV: 517	
REV: 518	
REV: 519	
REV: 520	
REV: 521	
REV: 522	
REV: 523	
REV: 524	
REV: 525	
REV: 526	
REV: 527	
REV: 528	
REV: 529	
REV: 530	
REV: 531	
REV: 532	
REV: 533	
REV: 534	
REV: 535	
REV: 536	
REV: 537	
REV: 538	
REV: 539	
REV: 540	
REV: 541	
REV: 542	
REV: 543	
REV: 544	
REV: 545	
REV: 546	
REV: 547	
REV: 548	
REV: 549	
REV: 550	
REV: 551	
REV: 552	
REV: 553	
REV: 554	
REV: 555	
REV: 556	
REV: 557	
REV: 558	
REV: 559	
REV: 560	
REV: 561	
REV: 562	
REV: 563	
REV: 564	
REV: 565	
REV: 566	
REV: 567	
REV: 568	
REV: 569	
REV: 570	
REV: 571	
REV: 572	
REV: 573	
REV: 574	
REV: 575	
REV: 576	
REV: 577	
REV: 578	
REV: 579	
REV: 580	
REV: 581	
REV: 582	
REV: 583	
REV: 584	
REV: 585	
REV: 586	
REV: 587	
REV: 588	
REV: 589	
REV: 590	
REV: 591	
REV: 592	
REV: 593	
REV: 594	
REV: 595	
REV: 596	
REV: 597	
REV: 598	
REV: 599	
REV: 600	
REV: 601	
REV: 602	
REV: 603	
REV: 604	
REV: 605	
REV: 606	
REV: 607	
REV: 608	
REV: 609	
REV: 610	
REV: 611	
REV: 612	
REV: 613	
REV: 614	
REV: 615	
REV: 616	
REV: 617	
REV: 618	
REV: 619	
REV: 620	
REV: 621	
REV: 622	
REV: 623	
REV: 624	
REV: 625	
REV: 626	
REV: 627	
REV: 628	
REV: 629	
REV: 630	
REV: 631	
REV: 632	
REV: 633	
REV: 634	
REV: 635	
REV: 636	
REV: 637	
REV: 638	
REV: 639	
REV: 640	
REV: 641	
REV: 642	
REV: 643	
REV: 644	
REV: 645	
REV: 646	
REV: 647	
REV: 648	
REV: 649	
REV: 650	
REV: 651	
REV: 652	
REV: 653	
REV: 654	
REV: 655	
REV: 656	
REV: 657	
REV: 658	
REV: 659	
REV: 660	
REV: 661	
REV: 662	
REV: 663	
REV: 664	
REV: 665	
REV: 666	
REV: 667	
REV: 668	



THIS DRAWING AND SPECIFICATIONS HEREIN ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR COPIED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION. COPYRIGHT © 1974 DIGITAL EQUIPMENT CORPORATION

REVISIONS		
CHK	CHANGE NO.	REV.



REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	FRACTION MULTIP HIGH (FMH)	SIZE CODE	NUMBER	REV.
SCALE	2/1	SHEET	3 OF 3	D
DIST.		TW		

LINE ITEM	DOCUMENT NUMBER	PART NUMBER	DESCRIPTION	QTY PER VARIATION	REFERENCE DESIGNATOR
			00		
1	1	D-MD-5013098-0-0	5013098-00	M8286	1
2	2		1012784-00	.047 MFD 50V -20+80 CER	53
3	3		1012084-01	8 MFD 25V G% 300 AL EL	7
4	4		1300250-00	150 1/4W 5% CC	4
5	5		1300247-00	120 1/4W 5% CC	4
6	6		1300295-00	330 1/4W 5% CC	4
7	7		1301890-00	560 1/4W 5% CC	4
8	8		1913788-00	26S10 TRANSCEIVER,BUS,QUA	4
9	9		1910552-00	74S194 SHIFT REG.,4BIT RIGH	20
				CONT	E1,E15,E29,E39
				CONT	E2,E16,E30,E33,E34,E40,E49,E50,
					E52,E53,E60,E61,E70,E72,E74,E75,
					E78,E81,E82,E89
10	10		1911641-00	SN 74S257 MUX,QUAD 2 TO 1	7
11	11		1913670-00	74S373 LATCH 8BIT TRASP TR	13
				CONT	E3,E17,E31,E41,E65,E68,E69
					E4,E5,E6,E19,E18,E20,E32,E42,
				CONT	E43,E44,E54,E55,E56
					E7,E8,E21,E22,E45,E46,E57,E58,
				CONT	E104,F120
13	13		23012B1-00	B1-01 OR CUSTOM MASKED ROM (74S2	6
14	14		1910531-00	DEC 74S181 ALU-4BIT	6
15	15		1910548-00	74S157 MUX 1 OF 2 (QUAD)	6
16	16		1913671-00	74S374 FF-D OCTAL TRISTATE	4
17	17		1912389-00	74S08 AND GATE-QUAD 2IN,PO	3
18	18		1911415-00	10125 ECL TO TTL TRNSLTR	2
19	19		1913493-00	74S241 OCTAL BUFFER,TRI-STA	2
20	20		1913700-00	74S381 ALU-4BIT	3
21	21		1912388-00	74S02 NOR GATE-QUAD 2IN,PO	5
22	22		1912097-00	SN 74S182 LOOK AND CARRY GEN	1
23	23		1910534-00	74S04 INVERTER GATE-HEX 1I	5
24	24		1910537-00	74S11 AND GATE-TRIPLE 3INP	2
25	25		1910957-00	74S175 FF-D QUAD COMMON CLO	5
26	26		1913294-00	93S16 COUNTER,SYNCH UP BIN	1
					E93

REVISION HISTORY			BASIC PART NO: M8286		DRN: F SMART		DATE: 14-OCT-77		D I G I T A L	
ENG	ECO NUMBER	REV	SECTION A OF A							
---	INIT	*	SECTION VARIATION INDEX		CHK'D: F SMART		DATE: 14-OCT-77		TITLE PARTS LIST	
WH	00001	D	[A]	00					FRACTION MULTIPLY HIGH	
			[B]		DES.ENG: STAN LACKEY		DATE: 21-OCT-77			
			[C]							
			[D]							
			[E]						DOCUMENT NUMBER	
			[F]		RESP.ENG.: STAN LACKEY		DATE: 21-OCT-77			
			[H]						SIZE	CODE
			[J]						NUMBER	REV
			[K]		MFG.ENG.: MIKE TERELLA		DATE: 21-OCT-77		K	PL
			[L]						M8286-0-DBP	D
			[M]		ASSEMBLY NUMBER:		TOP DOCUMENT NUMBER:		FILE NAME:	
			[N]		D-UA-M8286-0-0		M8286		Z06300.PLS	
"THIS DRAWING AND SPECIFICATIONS HEREIN, ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION. COPYRIGHT (C) 1979, DIGITAL EQUIPMENT CORPORATION "										

TW

AUTOMATED BY PRTLST.1C(3)

PARTS LIST

SHEET A2 OF A2

LINE	ITEM	DOCUMENT NUMBER	PART NUMBER	DESCRIPTION	QTY PER VARIATION	REFERENCE DESIGNATOR
					00	
27	27		1910536-00	74S10 NAND GATE-TRIPLE 3IN	4	E94,E114,E124,E135
28	28		1910532-00	74S00 NAND GATE-QUAD 2INS	2	E95,E126
29	29	BLANK	1910651-00	*** THIS ITEM IS NOT USED ***	-	
30	30		1910542-00	74S64 A-O-I GATE 4-2-3-2	9	E99,E100,E109,E112,E113,E122,
					CONT	E123,E129,E130
31	31		1912746-00	DEC 74S37 NAND GATE-QUAD 2IN	3	E100,E132,E133
32	32		1910545-00	74S112 FF-JK DUAL,EDGE TRIG	1	E102
33	33		1910544-00	74S74 FF-D DUAL,EDGE TRIGG	1	E103
34	34		1910550-00	74S174 FF-D HEX	2	E106,E116
35	35		1911712-00	74S51 AND-OR GATE-INVERT D	3	E121,E111,E97
36	36		1910539-00	74S20 NAND GATE-DUAL 4INPU	2	E125,E136
37	37		1911675-00	74S138 DECODER/DEMUX 3-8 LIN	1	E128
38	38		1910541-00	74S40 NAND GATE-DUAL 4IN,B	1	E134
39	39		1210711-02	HANDLE,MODULE,HEX	1	
40	40		9000024-01	EYELET, ROLLED FLANGE, .121 OD X	12	
41	41		1301972-00	270 1/4W 5% CC	8	R6,R8,R14,R15,R19,R22,R23,R17
42	42		1300309-00	390 1/4W 5% CC	1	R25
43	43		1301424-00	680 1/4W 5% CC	1	R26

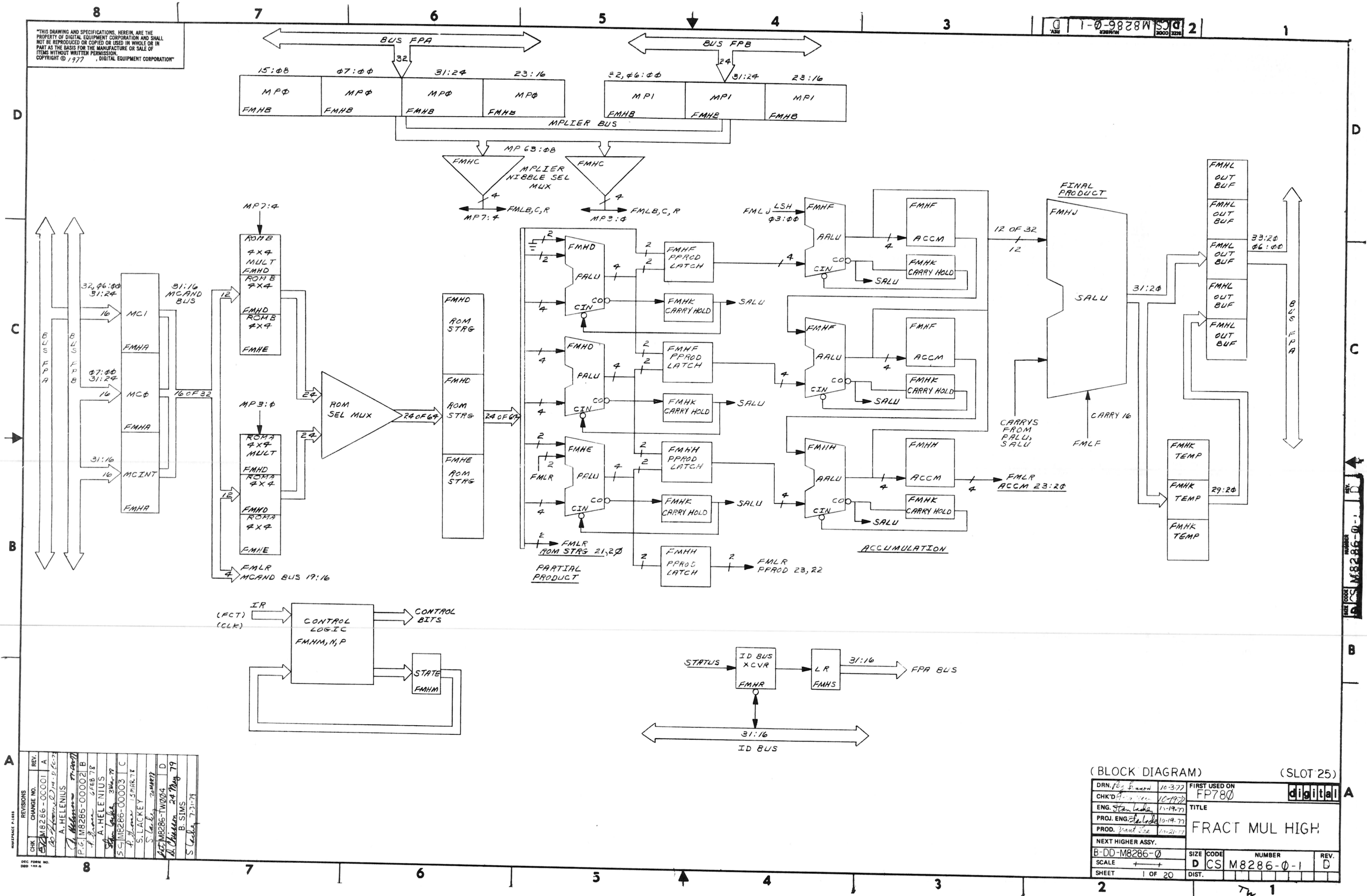
0 NOTE: IC SPARE LOCATIONS ARE E59,E131,E88,E92

D	I	G	I	T	A	L	TITLE	SECTION A OF A	SIZE	CODE	DOCUMENT NUMBER	REV.
							FRACTION MULTIPLY HIGH		K	PL	MA286-0-DHP	D

TW

THIS DRAWING AND SPECIFICATIONS, HEREIN, ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION.
COPYRIGHT © 1977, DIGITAL EQUIPMENT CORPORATION

1-0-98286-0-1

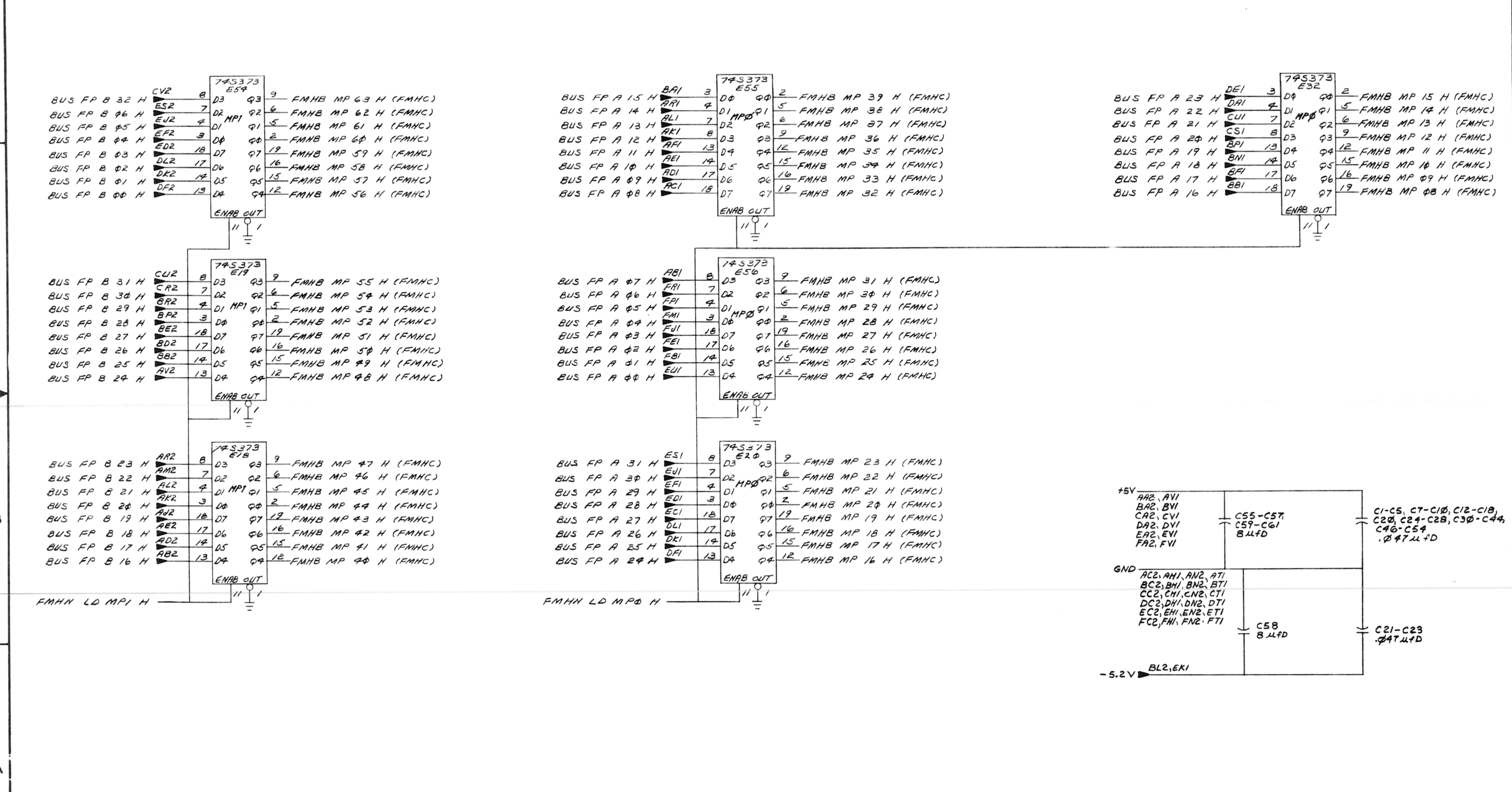


REV.	CHG.	NO.	DATE	BY	CHK.
1		1	10-3-77	A. HELENUS	
2		2	10-19-77	A. HELENUS	
3		3	10-19-77	A. HELENUS	
4		4	10-19-77	A. HELENUS	
5		5	10-19-77	A. HELENUS	
6		6	10-19-77	A. HELENUS	
7		7	10-19-77	A. HELENUS	
8		8	10-19-77	A. HELENUS	
9		9	10-19-77	A. HELENUS	
10		10	10-19-77	A. HELENUS	

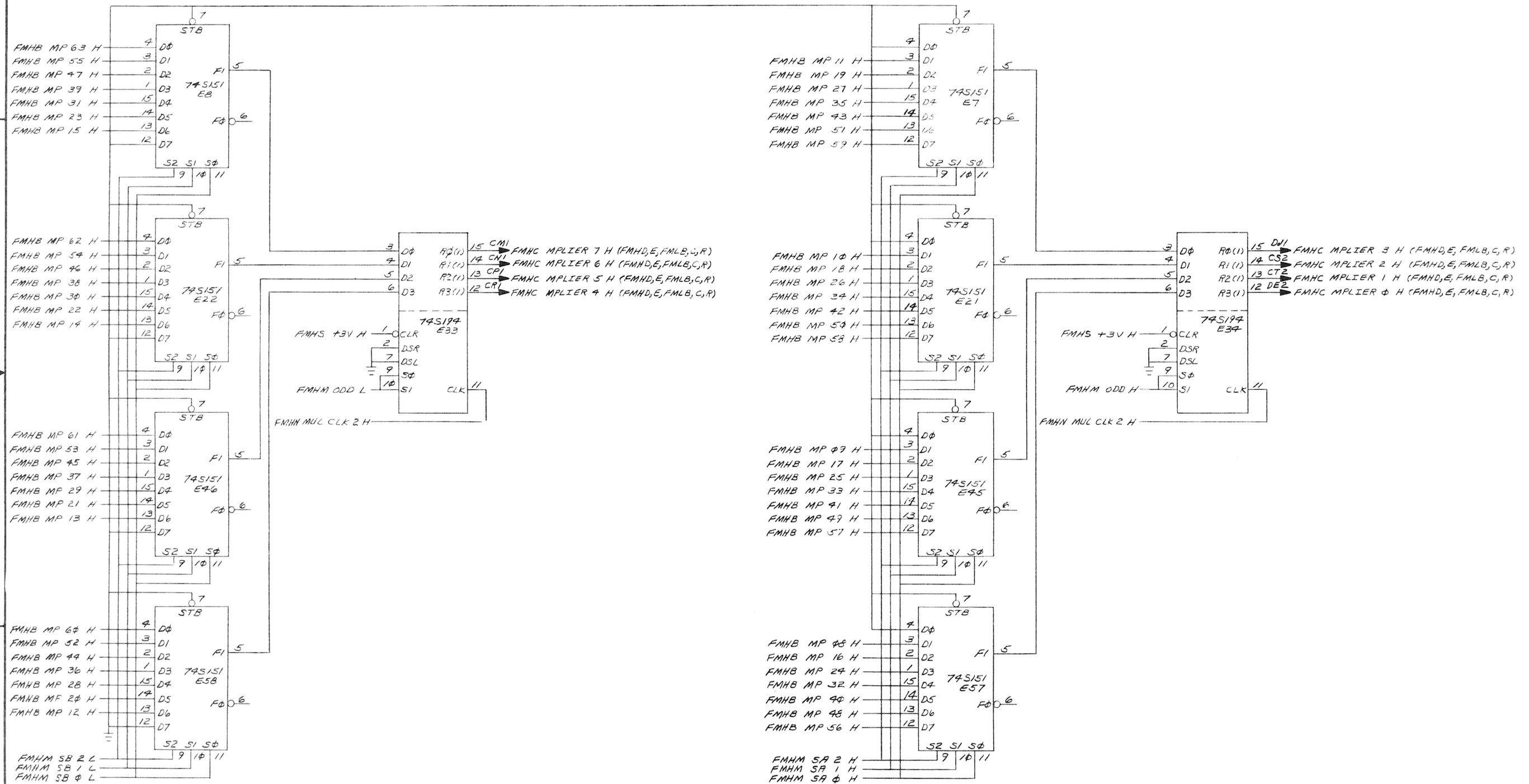
(BLOCK DIAGRAM)		(SLOT 25)	
DRN. No. 10-3-77	CHK'D 10-19-77	FIRST USED ON	FP780
ENG. Stan Loh	PROJ. ENG. Stan Loh	TITLE	FRACT MUL HIGH
PROD. Prod. Eng.			
NEXT HIGHER ASSY.		SIZE CODE	NUMBER
B-DD-M8286-0		D	CS M8286-0-1
SCALE	1 OF 20	DIST.	
SHEET			

DEC FORM NO
DRO 138

"THIS DRAWING AND SPECIFICATIONS, HEREIN, ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION. COPYRIGHT © 1977 DIGITAL EQUIPMENT CORPORATION"



"THIS DRAWING AND SPECIFICATIONS, HEREIN, ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION. COPYRIGHT © 1977 DIGITAL EQUIPMENT CORPORATION"



TITLE				NUMBER				REV.			
FRACT MUL HIGH (FMHC)				M 8286-0-1				U			
SCALE				SHEET				DIST.			
4 OF 20				1							

REVISIONS

CHK CHANGE NO. REV.

1

2

3

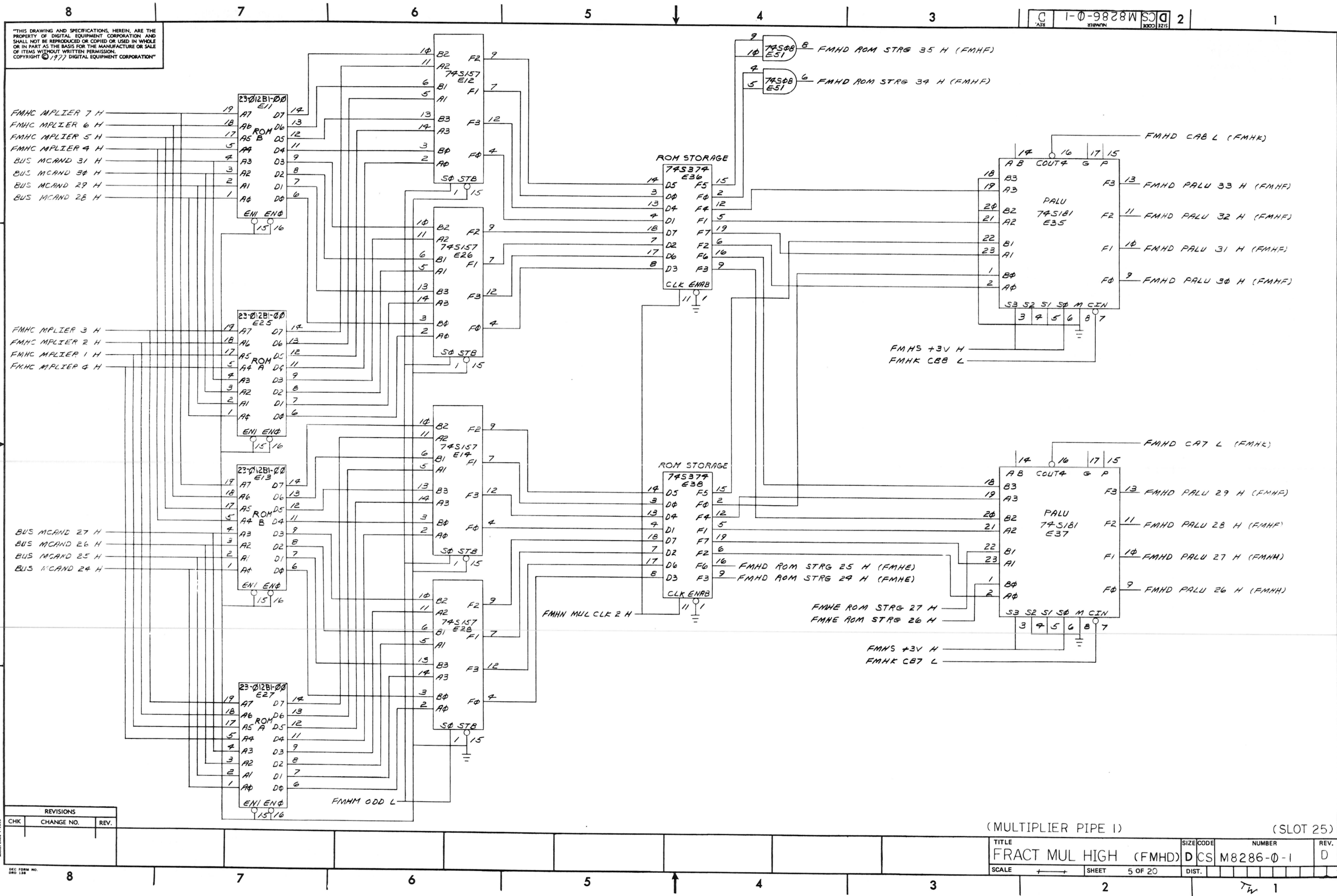
4

5

6

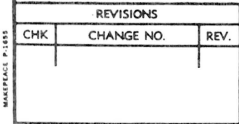
7

8



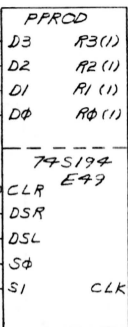
REVISIONS		
CHK	CHANGE NO.	REV.

(MULTIPLIER PIPE 1)		(SLOT 25)	
TITLE	FRACT MUL HIGH (FMHD)	SIZE CODE	D CS
SCALE	+	SHEET	5 OF 20
		DIST.	
		NUMBER	M8286-0-1
		REV.	D

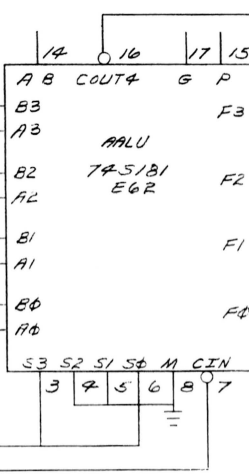


"THIS DRAWING AND SPECIFICATIONS, HEREIN, ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION, AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION. COPYRIGHT © 1977 DIGITAL EQUIPMENT CORPORATION"

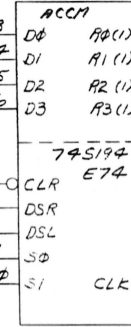
FMHD ROM STRG 35 H
FMHD ROM STRG 34 H
FMHD PALU 33 H
FMHD PALU 32 H



FMHJ LSH 03 H
FMHJ LSH 02 H
FMHJ LSH 01 H
FMHJ LSH 00 H

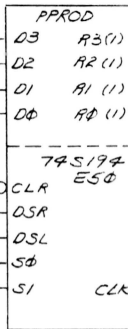


FMHF CC9 L (FMHK)
FMHF ALU 35 H (FMHJ)
FMHF ALU 34 H (FMHJ)
FMHF ALU 33 H (FMHJ)
FMHF ALU 32 H (FMHJ)

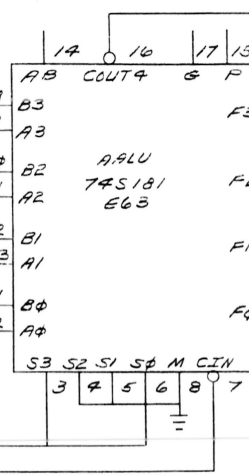


FMHF ACCM 31 H (FMHF)
FMHF ACCM 30 H (FMHF)
FMHF ACCM 29 H (FMHF)
FMHF ACCM 28 H (FMHF)

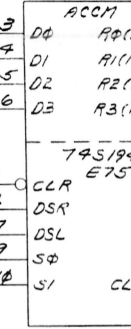
FMHD PALU 31 H
FMHD PALU 30 H
FMHD PALU 29 H
FMHD PALU 28 H



FMHF ACCM 31 H
FMHF ACCM 30 H
FMHF ACCM 29 H
FMHF ACCM 28 H



FMHF CC8 L (FMHK)
FMHF ALU 31 H (FMHJ)
FMHF ALU 30 H (FMHJ)
FMHF ALU 29 H (FMHJ)
FMHF ALU 28 H (FMHJ)



FMHF ACCM 27 H (FMHH)
FMHF ACCM 26 H (FMHH)
FMHF ACCM 25 H (FMHH)
FMHF ACCM 24 H (FMHH)

FMHP CLR UPPER L
FMHP PPROD CTL UPR H
FMHN MUL CLK 2 H

FMHE +3V H
FMHK CDB L

FMHP CLR UPPER L
FMHP ACCM CTL 0 H
FMHP ACCM CTL 1 H
FMHN MUL CLK 3 H

REVISIONS		
CHK	CHANGE NO.	REV.

(MULTIPLIER PIPE 3)

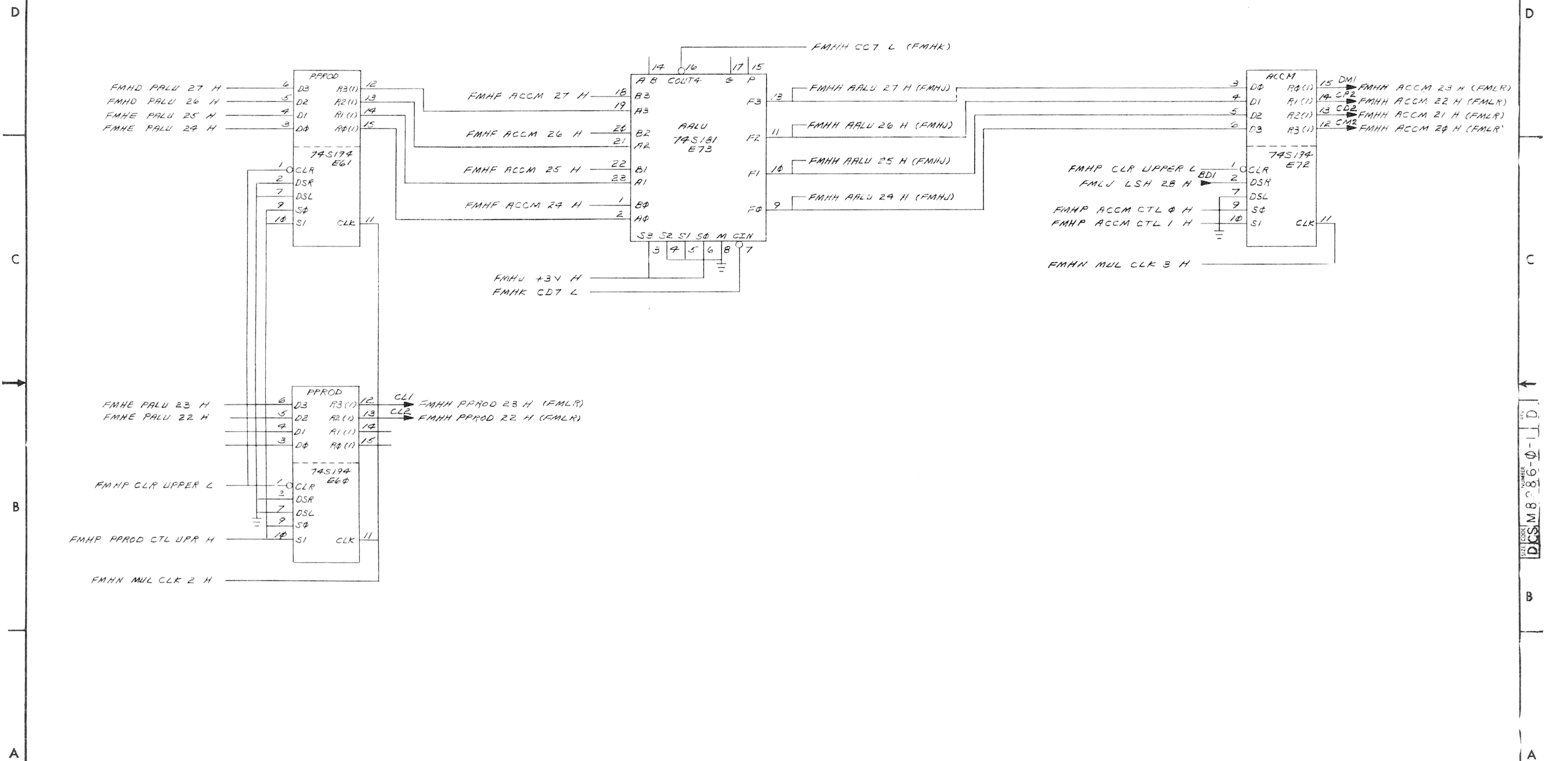
(SLOT 25)

TITLE	SIZE CODE	NUMBER	REV.
FRACTMUL HIGH (FMHF)	DCS	M8286-0-1	D
SCALE	SHEET	DIST.	
	7 OF 20		

DEC FORM NO. 138

DCS M8286-0-1

"THIS DRAWING AND SPECIFICATIONS, HEREIN, ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION, AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION. COPYRIGHT © 1977 DIGITAL EQUIPMENT CORPORATION"

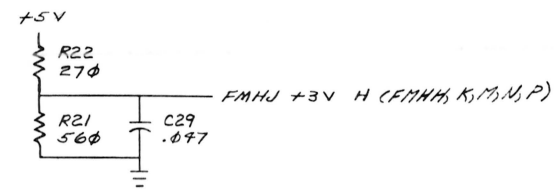
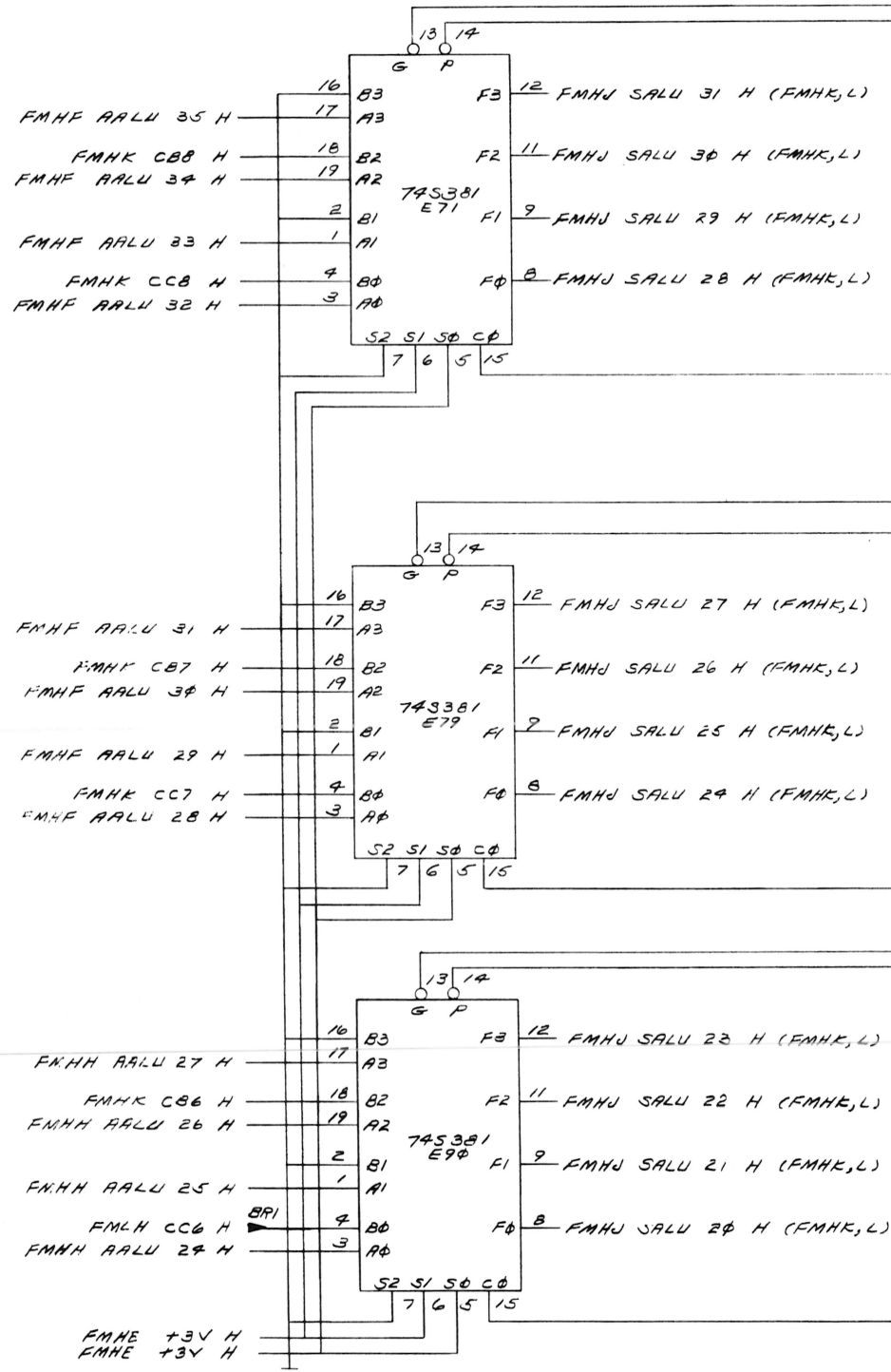


REVISIONS		
CHK	CHANGE NO.	REV.

(MULTIPLIER PIPE 4) (SLOT 25)

TITLE	SIZE CODE	NUMBER	REV.
FRACT MUL HIGH (FMHH)	DCS	M8286-0-1	D
SCALE	SHEET	DIST.	
	8 OF 20		

"THIS DRAWING AND SPECIFICATIONS, HEREIN, ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION. COPYRIGHT © 1977 DIGITAL EQUIPMENT CORPORATION"




REVISIONS		
CHK	CHANGE NO.	REV.

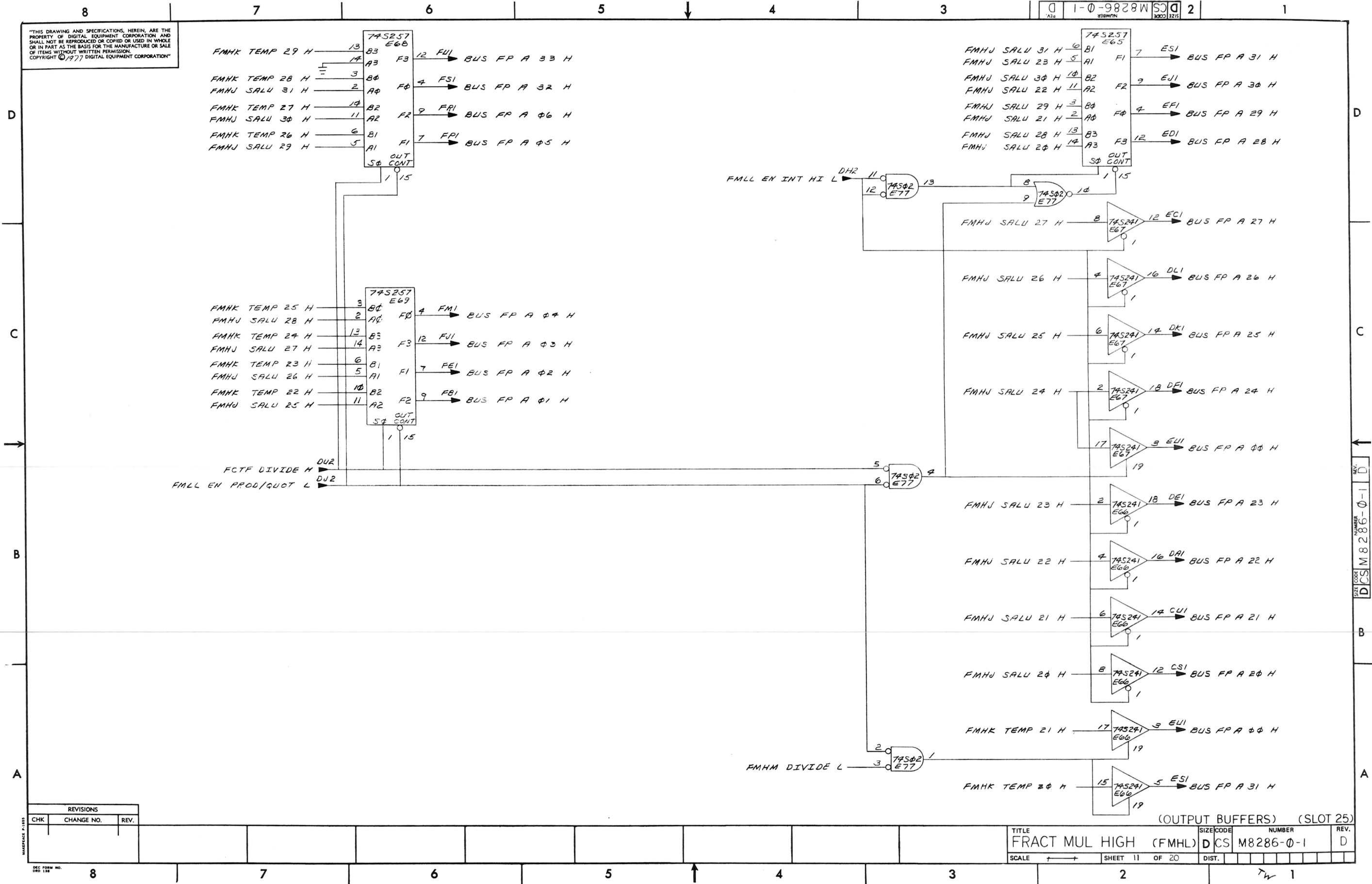
(MOST SIGNIF HALF OF ADDER) (SLOT 25)

TITLE	SIZE CODE	NUMBER	REV.
FRAC MUL HIGH (FMHJ)	DCS	M8286-0-1	D
SCALE	SHEET	9 OF 20	DIST.

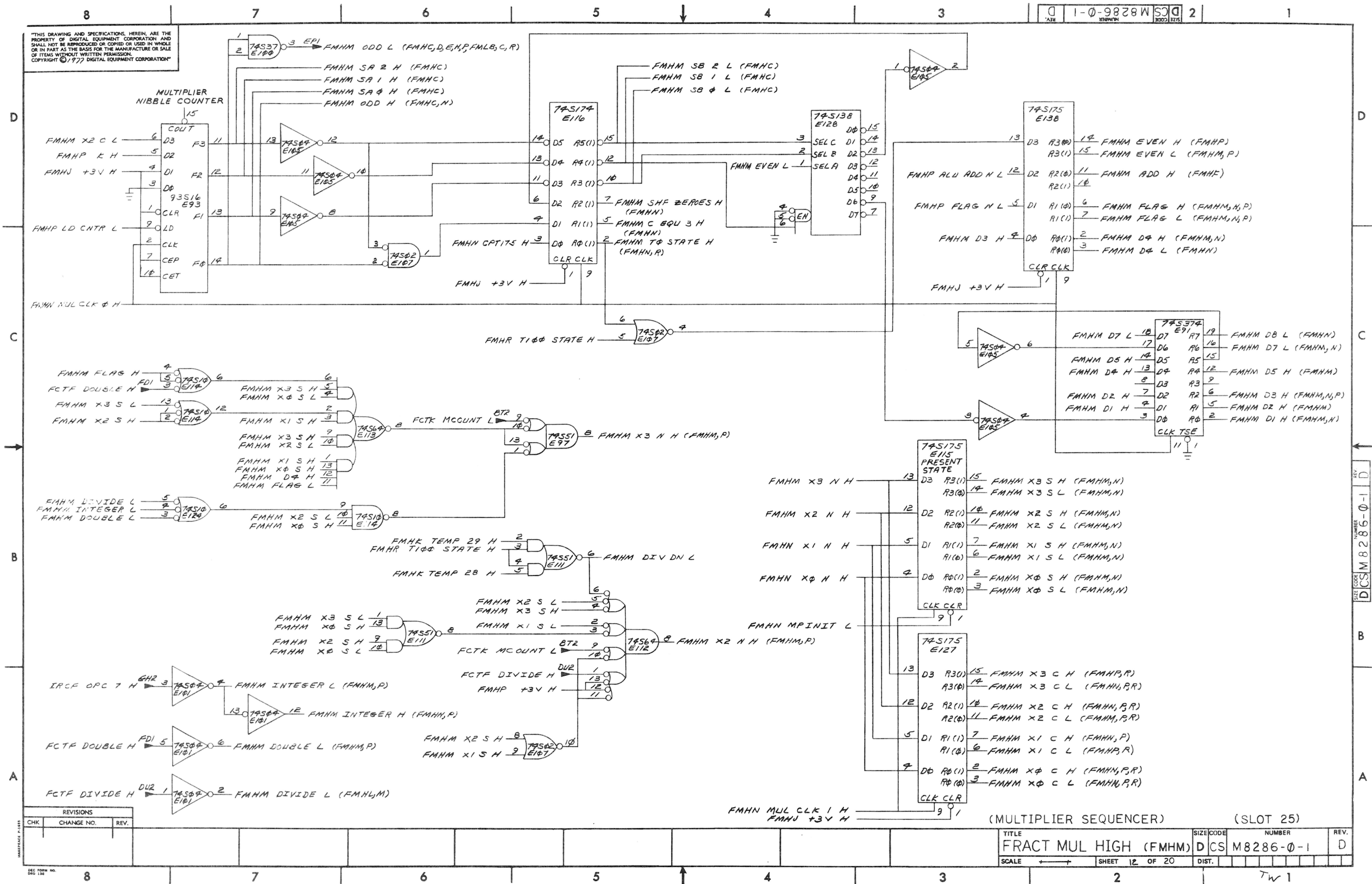


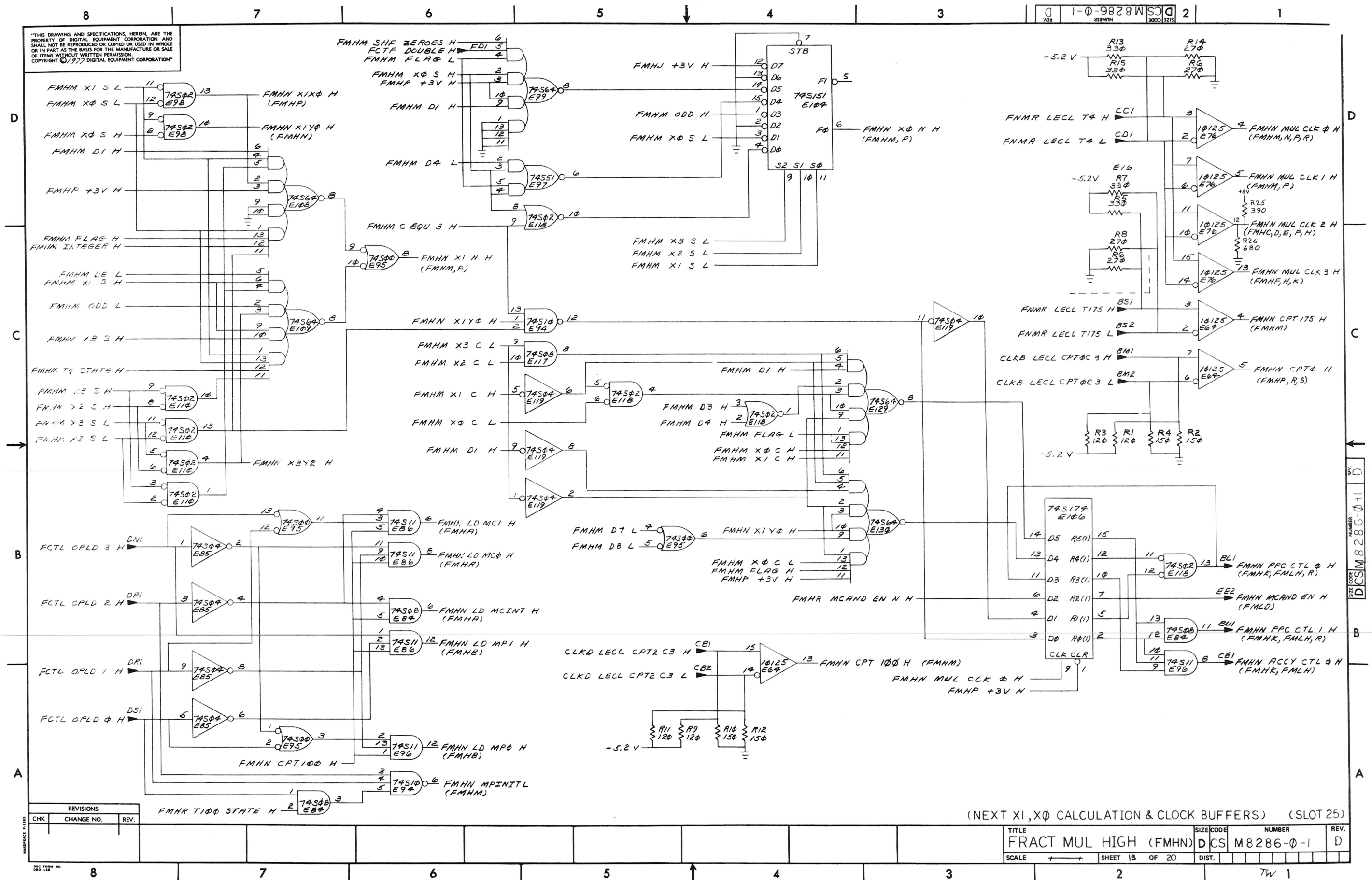
TITLE		SIZE/CODE		NUMBER		REV.	
FRACT MUL HIGH (FMHK)		D CS		M8286-0-1		D	
SCALE 		SHEET 10 OF 20		DIST.			

"THIS DRAWING AND SPECIFICATIONS, HEREIN, ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION. COPYRIGHT © 1977 DIGITAL EQUIPMENT CORPORATION"

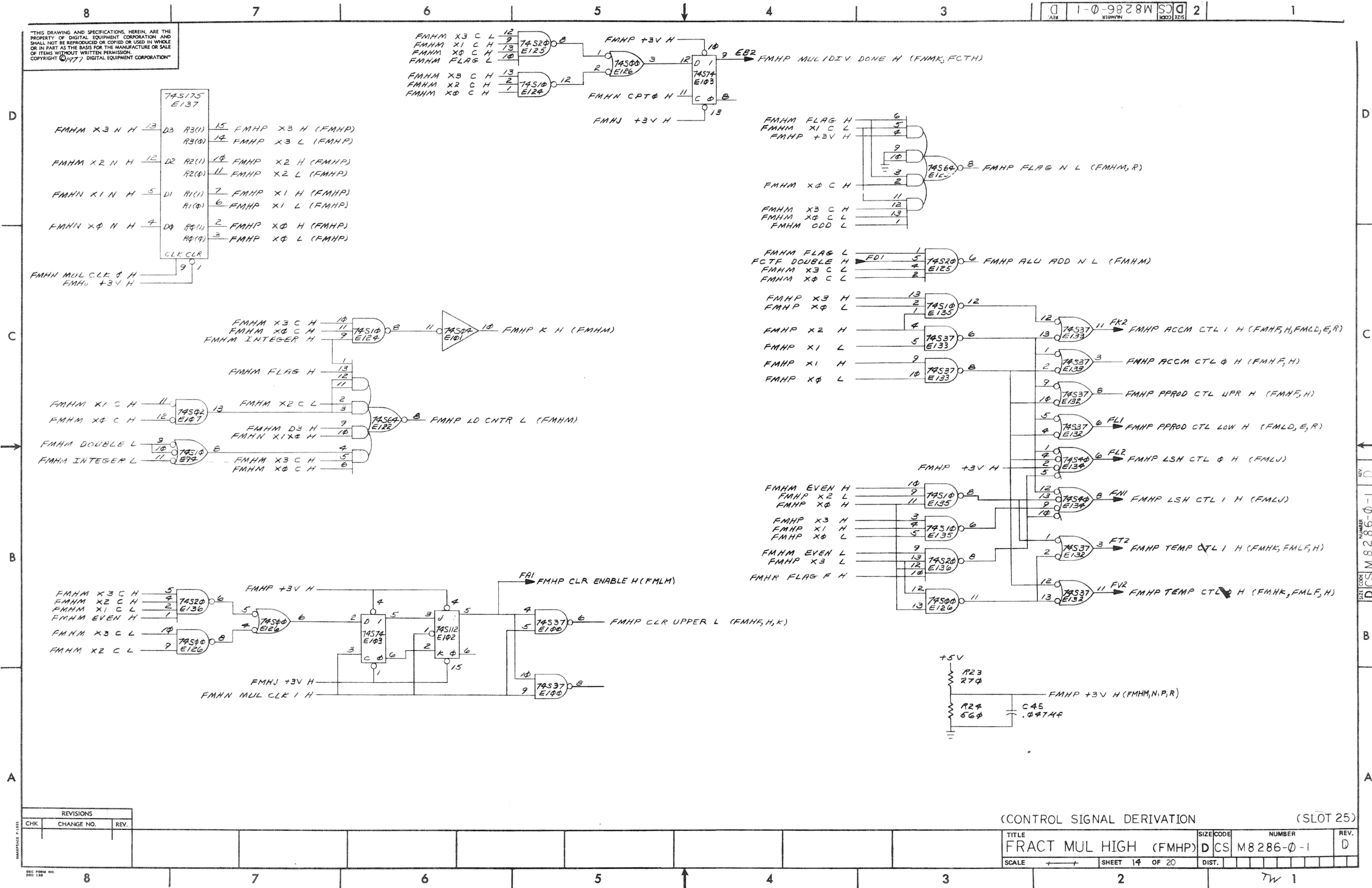


REVISIONS		
CHK	CHANGE NO.	REV.





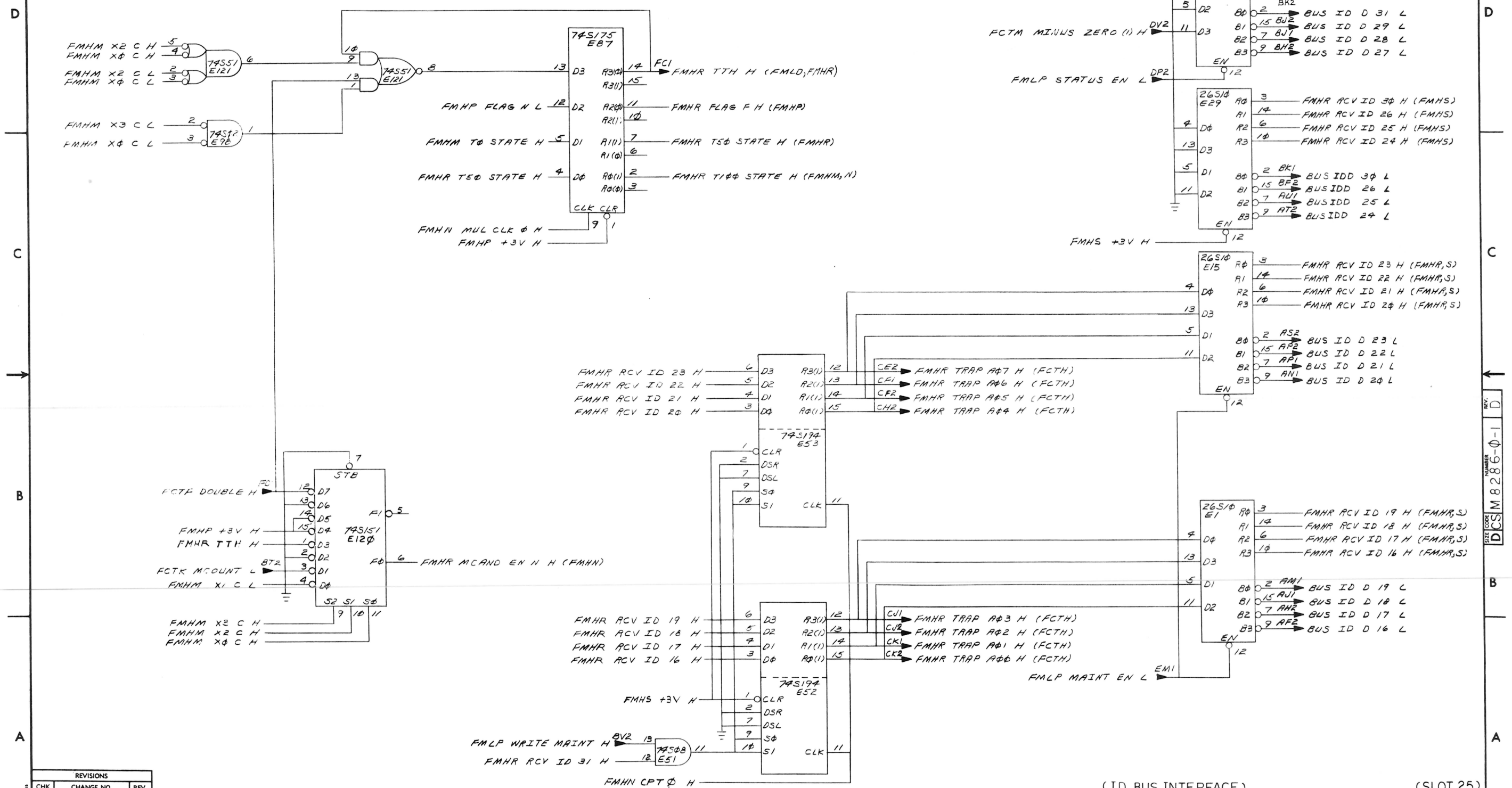
"THIS DRAWING AND SPECIFICATIONS, HEREIN, ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION. COPYRIGHT © 1977 DIGITAL EQUIPMENT CORPORATION"



REVISIONS		
CHK	CHANGE NO.	REV.

(CONTROL SIGNAL DERIVATION)		(SLOT 25)	
TITLE	SIZE CODE	NUMBER	REV.
FRACT MUL HIGH (FMHP)	D CS	M8286-0-1	D
SCALE	SHEET	OF	DIST.
	14	20	

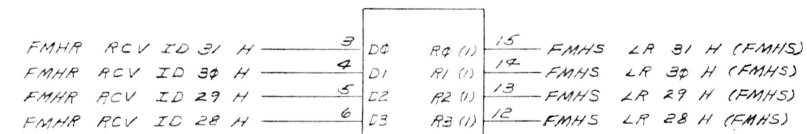
"THIS DRAWING AND SPECIFICATIONS, HEREIN, ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION. COPYRIGHT © 1977 DIGITAL EQUIPMENT CORPORATION"



REVISIONS		
CHK	CHANGE NO.	REV.

TITLE		SIZE	CODE	NUMBER		REV.
FRACT MUL HIGH (FMHR)		D	CS	M8286-0-1		D
SCALE		SHEET 15 OF 20		DIST.		

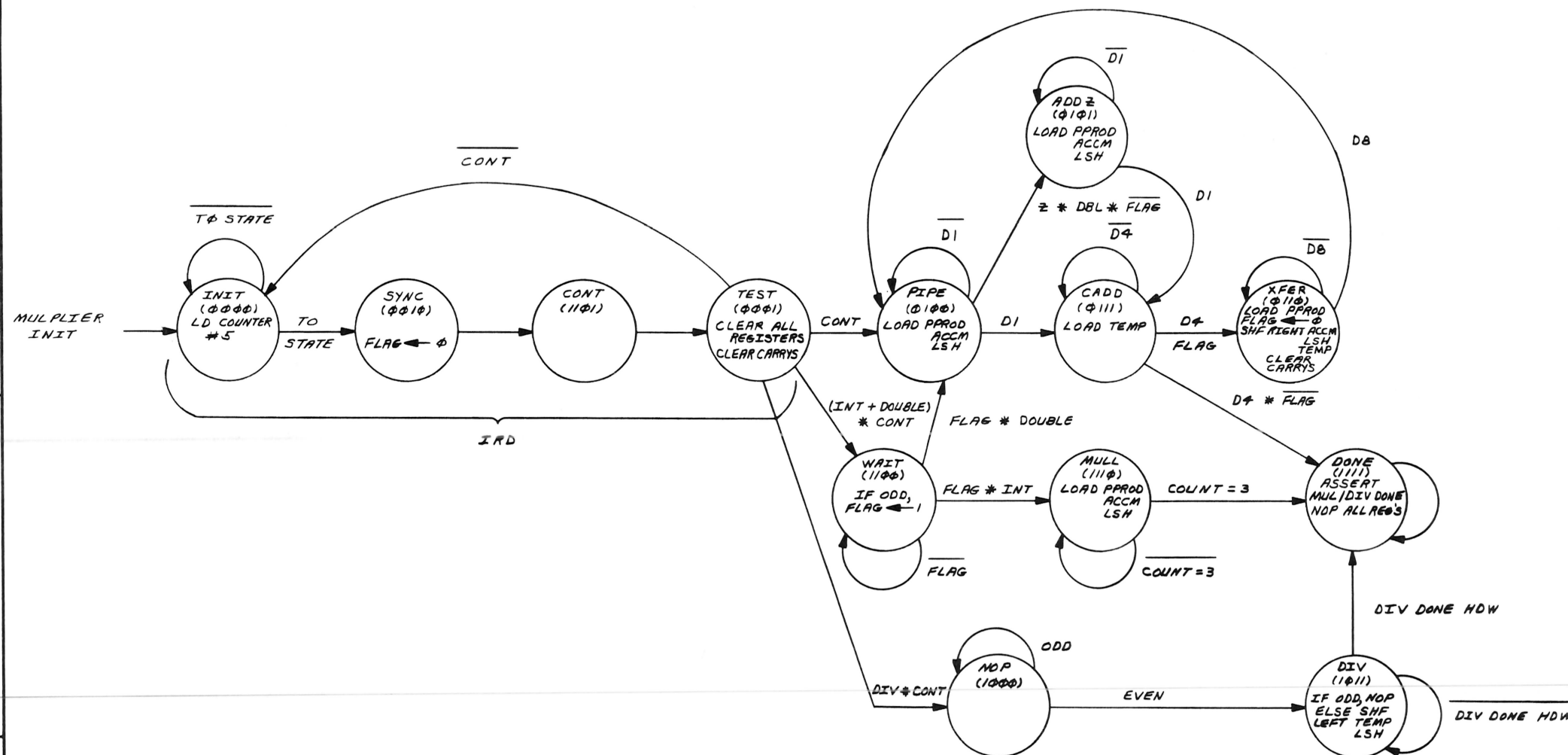
"THIS DRAWING AND SPECIFICATIONS, HEREIN, ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION. COPYRIGHT © 1977 DIGITAL EQUIPMENT CORPORATION"



"THIS DRAWING AND SPECIFICATIONS, HEREIN, ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION.
COPYRIGHT © 1977 DIGITAL EQUIPMENT CORPORATION"

1-0-9828W SCD 2

MULTIPLICAND REGISTERS ENABLED		
OPCODE	TTH	REGISTER
MULF, (POLYF)	X	MC1, MCX
MULD, (POLYD)	I	MC0, MCX
MULD, (POLYD)	Φ	MC1, MC1L
MULL	X	MCINT, MCX
EMODF	X	MC1, MCX
EMODD	I	MC0, MCX
EMODD	Φ	MC1, MC1L



REVISIONS		
CHK	CHANGE NO.	REV.

(SLOT 25)

(MULTIPLIER CONTROL STATE TRANSITION DIAGRAM)

TITLE	SIZE/CODE	NUMBER	REV.
FRACT MUL HIGH (FMHT)	D CS	M8286-0-1	D
SCALE	SHEET	OF	TW
	17	20	1

"THIS DRAWING AND SPECIFICATIONS, HEREIN, ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION. COPYRIGHT © 1977 DIGITAL EQUIPMENT CORPORATION"

* DON'T CARE STATE

STATE VARIABLES				NAME	NEXT STATE	DEFINITION	OUTPUT CONTROL										
X3	X2	X1	X0				LD CNTR	CNTR CONSTANT	NEXT TTH	NEXT ALU ADD	NEXT FLAG	NEXT CLR ALL	MUL/DIV DONE	PPRWD	ACOM	LSH	TEMP
0	0	0	0	INIT	IF 10, THEN 0000; ELSE 0010	RESULT OF INIT SIGNAL FROM MICROCODE. PREPARES MULTIPLIER NIBBLE SELECT COUNTER FOR MULF SEQUENCE.	1	1010	0	1 IF FLAG AND DOUBLE	PREV FLAG	1	0	NOP	NOP	NOP	NOP
0	0	1	0	SYNC	11 01	ENTRY FROM STATE 0000 AT T50 TO PROVIDE SYNCHRONIZATION BETWEEN MULTIPLIERS 50 ns. CLOCK AND MICROCODES 200 ns. CLOCK.	0	1010	0	1 IF FLAG AND DOUBLE	0	1	0	LD	SR	SR	SR
1	1	0	1	CONT	0001	NOP IF MULF OR ENMOD; LOAD MULTIPLIER NIBBLE SELECT COUNTER IF MUL, MULD, OR ENMOD.	1 IF DOUBLE OR INT	0110 IF INT ELSE 0010	1 IF DOUBLE ELSE 0	0	PREV FLAG	0	1	LD	LD	NOP	NOP
0	0	0	1	TEST	IF CONT., THEN 0000 ELSE IF DIV, THEN 1000; ELSE IF DBL. OR INT., 1100; ELSE 0100	TESTS OPCODE FOR FIRST EXECUTION STATE CALCULATION; CLEARS THE MULTIPLIER DATA PATH.	0	1010	PREV TTH	0	PREV FLAG	1	0	NOP	NOP	SL IF EVEN LD IF EVEN AND FLAG	LD
1	0	0	0	NOP	IF EVEN THEN 1000; ELSE 1011	WAITS FOR FIRST QUOTIENT BIT TO BE FORMED IN THE NALL.	1	1010	0	0	PREV FLAG	0	0	NOP	NOP	NOP	NOP
1	0	1	1	DIV	IF DIV DONE, THEN 1011; ELSE 1111	SHIFTS LSH AND TEMP LEFT ONE BIT TO ACCEPT QUOTIENT BITS IN DIVIDE	1 IF D3 AND DBL OR INT	1110 IF INT ELSE 1010	1 IF DOUBLE ELSE PREV TTH	0	PREV FLAG	0	0	NOP	NOP	SL IF EVEN	SL IF EVEN
1	1	0	0	WAIT	IF FLAG, THEN 1100 ELSE IF DBL, THEN 0100; ELSE 1110	CLEAR DATA PATH AND CARRY REGISTERS FOR MULD, ENMOD, AND MULL. WAITS FOR FIRST ROM LOOK UP.	1 IF INT AND FLAG	0010	PREV TTH	0	1 IF EVEN ELSE PREV FLAG	1 IF EVEN	0	LD	LD	LD	NOP
1	1	1	0	MULL	IF COUNT=3, THEN 1110 ELSE 1111	RUNS MULTIPLIER PIPE FOR MULL.	0	0010	PREV TTH	0	0	0	0	LD	LD	LD	SR
0	1	0	0	PIPE	IF SHF ZEROES, AND DBL. AND FLAG THEN 0101 ELSE IF D1, THEN 0111; ELSE 0100	RUNS MULTIPLIER PIPE FOR FLOATING POINT MULTIPLY OPERATIONS. ADDS LSH'S 4 LSB'S TO ACCM'S 4 MSB'S IF SECOND TIME THROUGH DBL MULTIPLY.	1 IF INT AND FLAG	0010	PREV TTH	1 IF FLAG AND DOUBLE	PREV FLAG	0	0	LD	LD	LD	NOP
0	1	1	1	CADD	IF D4, THEN 0111 ELSE IF FLAG, THEN 0110 ELSE 1111	STOPS PIPE TO ADD FINAL STORED, CARRIES TO FINAL ACCUMULATION. LOADS TEMP.	1 IF D3	0010	0	0	PREV FLAG	0	1 IF FLAG	NOP	NOP	LD IF EVEN AND FLAG	LD
0	1	1	0	XFER	IF D0, THEN 0110 ELSE 0100	SHIFTS ACCM, TEMP, AND LSH RIGHT TO TRANSFER.	0	0010	PREV TTH	1 IF DOUBLE	0	0	0	LD	SR	SR	SR
0	1	0	1	ADDZ	IF D1, THEN 0101 ELSE 0111	ADDS ZEROES TO ACCM'S 4 MSB'S.	0	0010	0	0	PREV FLAG	0	0	LD	LD	LD	LD
1	1	1	1	DONE	1111	STOPS ALL REGISTERS FROM CHANGING TO ALLOW NR OR CPU D REG. TO ACCEPT FINAL RESULT.	1 IF D3 AND DOUBLE OR INT	0110 IF INT ELSE 0010	1 IF DOUBLE	0	PREV FLAG	0	1	NOP	NOP	NOP	NOP

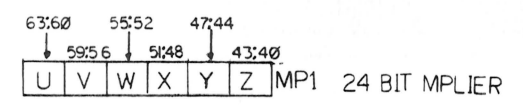
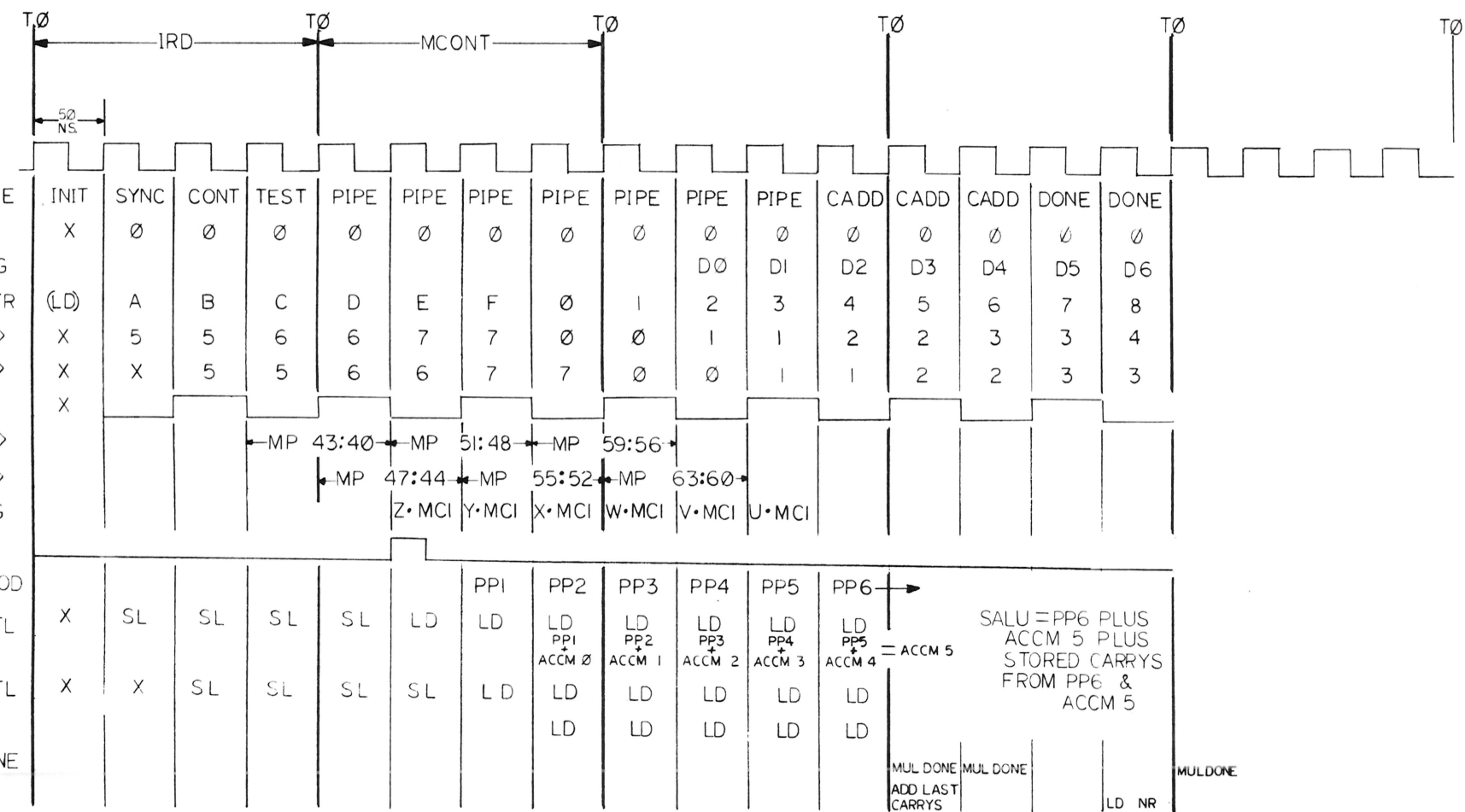
REVISIONS		
CHK	CHANGE NO.	REV.

(MULTIPLIER CONTROL SIGNALS) (SLOT 25)

TITLE	SIZE CODE	NUMBER	REV.
FRAC MUL HIGH (FMHU)	DCS	M8286-0-1	D
SCALE	SHEET	OF	
	18	20	

"THIS DRAWING AND SPECIFICATIONS, HEREIN, ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION OF DIGITAL EQUIPMENT CORPORATION"

MULF TIMING



ACCM 1 = PP1 + ACCM 0 → LSH

ACCM 2 = PP2 + ACCM 1 → LSH

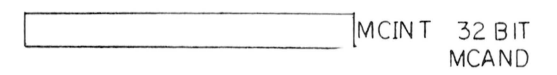
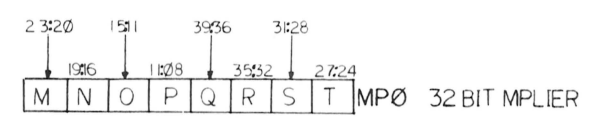
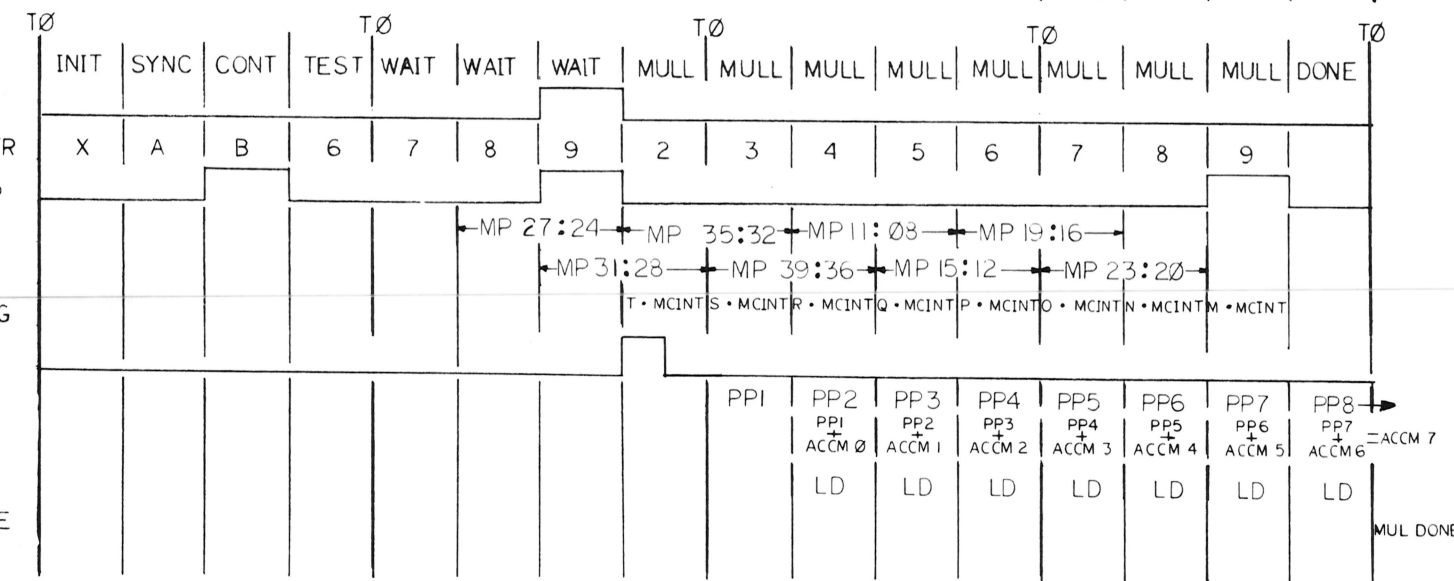
ACCM 3 = PP3 + ACCM 2 → LSH

ACCM 4 = PP4 + ACCM 3 → LSH

ACCM 5 = PP5 + ACCM 4 → LSH

* AFTER EACH ADDITION OF THE PARTIAL PRODUCT AND ACCUMULATOR CONTENTS, THE 4 LEAST SIGNIFICANT BITS OF THE RESULT ARE LOADED INTO THE LSH REGISTER.

MULL TIMING



ACCM 1 = PP1 + ACCM 0 → LSH

ACCM 2 = PP2 + ACCM 1 → LSH

ACCM 3 = PP3 + ACCM 2 → LSH

ACCM 4 = PP4 + ACCM 3 → LSH

ACCM 5 = PP5 + ACCM 4 → LSH

ACCM 6 = PP6 + ACCM 5 → LSH

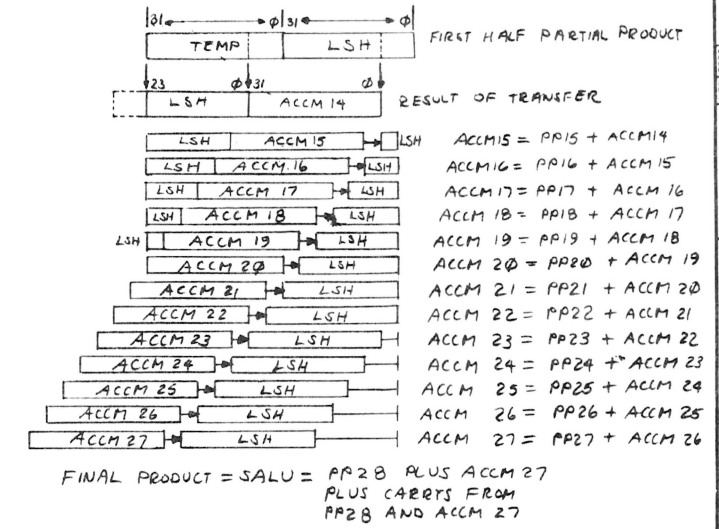
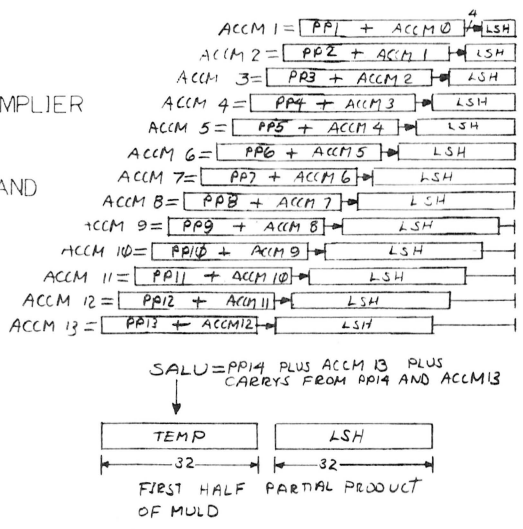
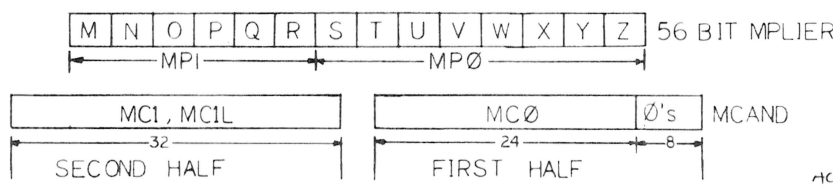
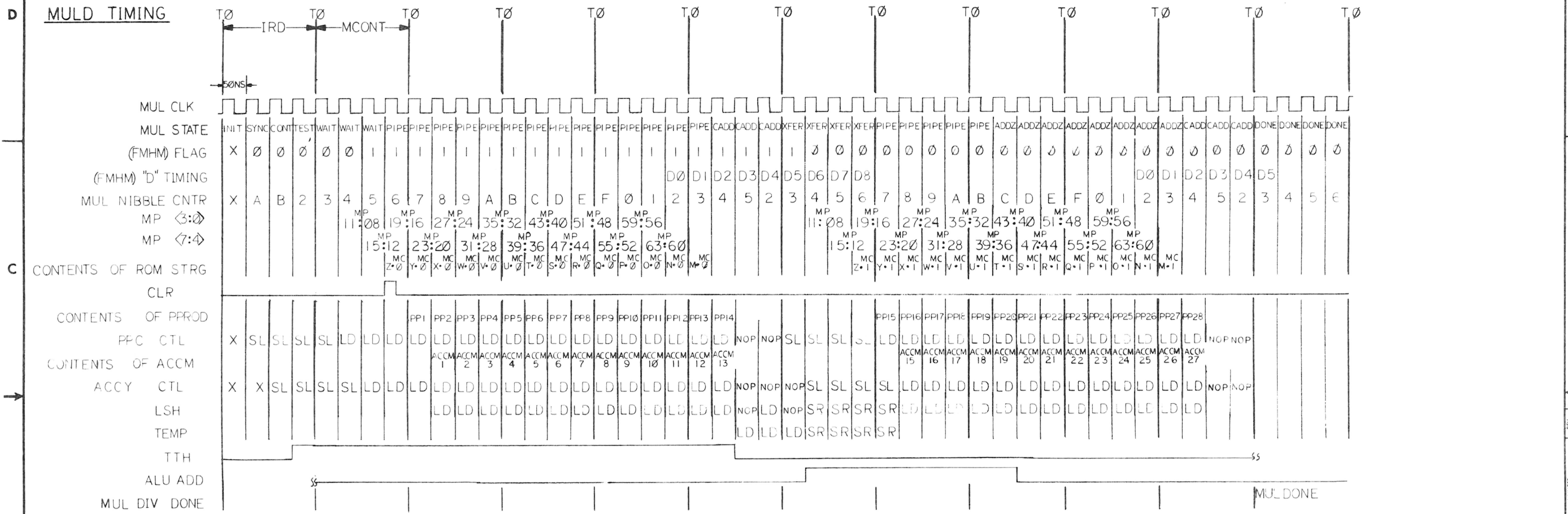
ACCM 7 = PP7 + ACCM 6 → LSH

SALU = PP8 PLUS ACCM 7 PLUS STORED CARRYS FROM PP8 & ACCM 7

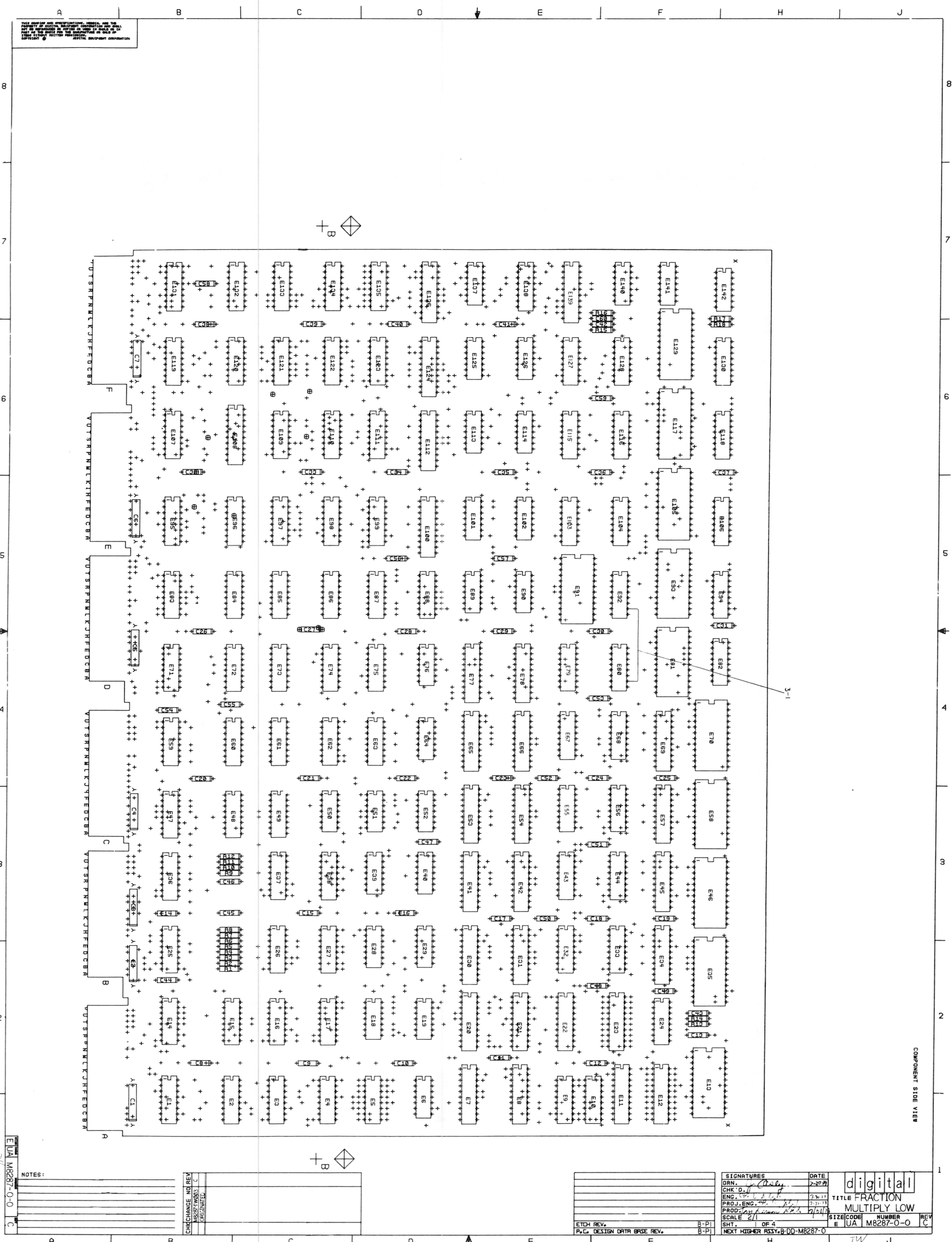
DRN. RLENNON	3-NOV-77	FIRST USED ON	VAX STAR
CHK'D FERGUSON	19-NOV-77	TITLE	MULF, MULL
ENG. S. LACKEY	19-NOV-77	TITLE	TIMING DIAGRAM
PROJ. ENGS. LACKEY	19-NOV-77	SIZE	D CS
PROD. G. LEE	21-NOV-77	NUMBER	M8286-0-1
NEXT HIGHER ASSY.		REV.	D
SCALE	1/1	SHEET	19 OF 20
		DIST.	

REVISIONS	REV.
CHANGE NO.	
CHK	

"THIS DRAWING AND SPECIFICATIONS, HEREIN, ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION. COPYRIGHT © DIGITAL EQUIPMENT CORPORATION"



REVISIONS		
CHK	CHANGE NO.	REV.



CHANGE NO	REV	DATE
1	C	7/5/79
2	C	7/5/79
3	C	7/5/79
4	C	7/5/79
5	C	7/5/79
6	C	7/5/79
7	C	7/5/79
8	C	7/5/79
9	C	7/5/79
10	C	7/5/79

CHANGE NO	REV	DATE
1	C	7/5/79
2	C	7/5/79
3	C	7/5/79
4	C	7/5/79
5	C	7/5/79
6	C	7/5/79
7	C	7/5/79
8	C	7/5/79
9	C	7/5/79
10	C	7/5/79

CHANGE NO	REV	DATE
1	C	7/5/79
2	C	7/5/79
3	C	7/5/79
4	C	7/5/79
5	C	7/5/79
6	C	7/5/79
7	C	7/5/79
8	C	7/5/79
9	C	7/5/79
10	C	7/5/79

CHANGE NO	REV	DATE
1	C	7/5/79
2	C	7/5/79
3	C	7/5/79
4	C	7/5/79
5	C	7/5/79
6	C	7/5/79
7	C	7/5/79
8	C	7/5/79
9	C	7/5/79
10	C	7/5/79

CHANGE NO	REV	DATE
1	C	7/5/79
2	C	7/5/79
3	C	7/5/79
4	C	7/5/79
5	C	7/5/79
6	C	7/5/79
7	C	7/5/79
8	C	7/5/79
9	C	7/5/79
10	C	7/5/79

CHANGE NO	REV	DATE
1	C	7/5/79
2	C	7/5/79
3	C	7/5/79
4	C	7/5/79
5	C	7/5/79
6	C	7/5/79
7	C	7/5/79
8	C	7/5/79
9	C	7/5/79
10	C	7/5/79

CHANGE NO	REV	DATE
1	C	7/5/79
2	C	7/5/79
3	C	7/5/79
4	C	7/5/79
5	C	7/5/79
6	C	7/5/79
7	C	7/5/79
8	C	7/5/79
9	C	7/5/79
10	C	7/5/79

"THIS DRAWING AND SPECIFICATIONS HEREIN ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION.
COPYRIGHT © 1979, DIGITAL EQUIPMENT CORPORATION

A	REVISIONS		
	CHK	CHANGE NO.	REV

TITLE	SIZE CODE	NUMBER	REVISION
FRACTION MULTIPLY LOW	EUA	M8287-0-0	C

REWORK INSTRUCTIONS

ECO #3

WIRE ADDS SIDE 1:

3-1 FROM E92-10 TO E80-10

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE FRACTION MULTIPLY LOW		SIZE CODE EUA	NUMBER M8287-0-0	REV C
SCALE	SHEET 4 OF 4	DIST.		
2		TH	1	

LINE ITEM	DOCUMENT NUMBER	PART NUMBER	DESCRIPTION	QTY PER VARIATION	REFERENCE DESIGNATOR
				00	
1	1	D-MD-5013091-0-0	5013091-00 FML	1	
2	2		1012084-01 8 MFD 75V G% 30D AT EL	7	C1-C7
3	3		1012784-00 .047 MFD 50V -20+80 CER	53	C8-C60
4	4		1300247-00 120 1/4W 5% CC	4	R2,R4,R6,R8
5	5		1300250-00 150 1/4W 5% CC	4	R1,R3,R5,R7
6	6		1301972-00 270 1/4W 5% CC	4	R9,R11,R13,R15
7	7		1300295-00 330 1/4W 5% CC	2	R10,R12
8	8		1301890-00 560 1/4W 5% CC	2	R14,R16
9	9		1910532-00 74S00 NAND GATE-QUAD 2INS	3	E19,E102,E125
10	10		1910534-00 74S04 INVERTER GATE-HEX 1I	6	E51,E76,E89,E126,E140,E141
11	11		1912389-00 74S08 AND GATE-QUAD 2IN,PO	4	E6,E64,E113,E137
12	12		1910536-00 74S10 NAND GATE-TRIPLE 3IN	3	E40,E50,E101
13	13		1910537-00 74S11 AND GATE-TRIPLE 3INP	2	E52,E114
14	14		1910539-00 74S20 NAND GATE-DUAL 4INPU	4	E28,E29,E39,E90
15	15		1912746-00 DEC 74S37 NAND GATE-QUAD 2IN	2	E18,E142
16	16		1910548-00 74S157 MUX 1 OF 2 (QUAD)	10	E9,E10,E32,E33,E43,E44,E55,E56, CONT E67,E68
17	17		1910531-00 DEC 74S181 FLU-4BIT	11	E13,E35,E46,E58,E70,E81,E91,E93, CONT E105,E117,E129
18	18		1912097-00 SN 74S182 LOOK AND CARRY GEN	1	E88
19	19		1910552-00 74S194 SHIFT REG.,4BIT RIGH	36	E3,E16,E24,E26,E37,E49,E61,E67, CONT E63,E73,E74,E79,E80,E82,E85,E86, CONT E92,E94,E97,E99,E103,E104,E106, CONT E109,E111,E115,E116,E118,E121, CONT E123,E127,E128,E130,E133,E135, CONT E138
20	20		1913493-00 74S241 OCTAL BUFFER,TRI-STA	1	E108
21	21		1911641-00 SN 74S257 MUX,QUAD 2 TO 1	23	E1,E2,E4,E14,E15,E17,E27,E38, CONT E48,E60,E72,E84,E95,E96,E98, CONT E107,E110,E119,E120,E122,E131.

REVISION HISTORY			BASIC PART NO: M8287		DRN: F SMART		DATE: 19-OCT-77		D I G I T A L	
ENG	ECO NUMBER	REV	SECTION A OF A	CHK'D: F SMART	DATE: 19-OCT-77	TITLE PARTS LIST				
---	INITIAL	C	SECTION VARIATION INDEX			FRACTION MULITPLY LOW				
			[A] 00							
			[B]	DES.ENG: S LACKEY	DATE: 21-OCT-77					
			[C]							
			[D]							
			[E]							
			[F]	RESP.ENG.: S LACKEY	DATE: 21-OCT-77	DOCUMENT NUMBER				
			[H]							
			[J]			SIZE CODE NUMBER REV				
			[K]	MFG.ENG.: M TERELLA	DATE: 21-OCT-77	K	PL	M8287-0-DRP	C	
			[L]							
			[M]	ASSEMBLY NUMBER:	TOP DOCUMENT NUMBER:	FILE NAME:		EDIT *		
			[N]	D-UA-M8287-0-0		M8287.PLS		4		
"THIS DRAWING AND SPECIFICATIONS HEREIN, ARE THE PROPERT* OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION. COPYRIGHT (C) 1979. DIGITAL EQUIPMENT CORPORATION "										

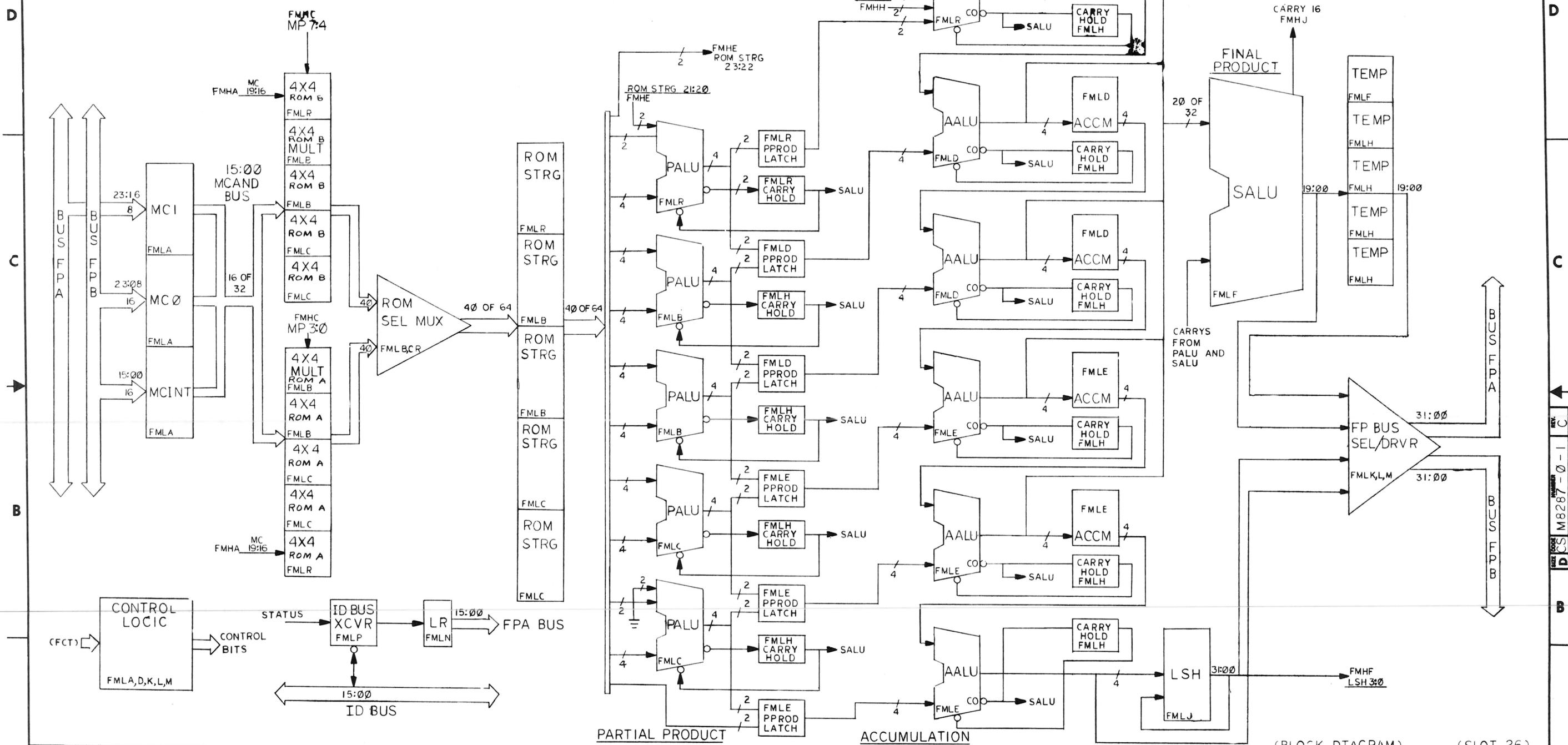
LINE ITEM	DOCUMENT NUMBER	PART NUMBER	DESCRIPTION	QTY PER VARIATION 00	REFERENCE DESIGNATOR
22	22	23012B1-00	B1-01 OR CUSTOM MASKED ROM (74S2	10	CONT E132,E134 E7,E8,E30,E31,E41,E42,E53,E54.
23	23	1913670-00	74S373 LATCH 8BIT TRASP TR	5	CONT E65,E66
24	24	1913671-00	74S374 F-D OCTAL TRISTATE	5	E20-E22,E77,E78
25	25	1913700-00	74S381 FLN-4BIT	5	E11,E34,E45,E57,E69
26	26	1912828-00	LS85 COMPARATOR,4BIT MAGN	2	E100,E112,E124,E136,E139
27	27	1911415-00	10125 PC TO TTL TRNSLTR	2	E75,E87
28	28	1913788-00	26S10 TRANSCEIVER,BUS,QUA	4	E25,E36
29	29	1210711-02	HANDLE,MODULE,TEX	1	E47,E59,E71,E83
30	30	9000024-01	EYELET, ROLLED FLANGE, .121 OD X	12	
31	31	9105740-55	WIRE(WRAP)30AWG UL1423	A/R	
32	32	1300309-00	390 1/4W 5% CC	1	R17
33	33	1301424-00	680 1/4W 5% CC	1	R18

0 NOTE: I.C. SPARE LOCATIONS ARE E5,E12,E23

D	I	G	I	T	A	L	TITLE	SECTION A OF A	SIZE	CODE	DOCUMENT NUMBER	REV
							FRACTION MULITPLY LOW		K	PL	M8287-0-DRP	C

"THIS DRAWING AND SPECIFICATIONS, HEREIN, ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION.
COPYRIGHT © 1977 DIGITAL EQUIPMENT CORPORATION"

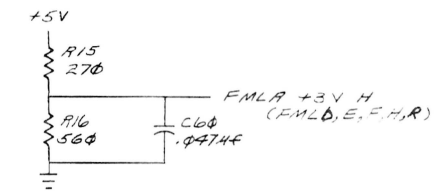
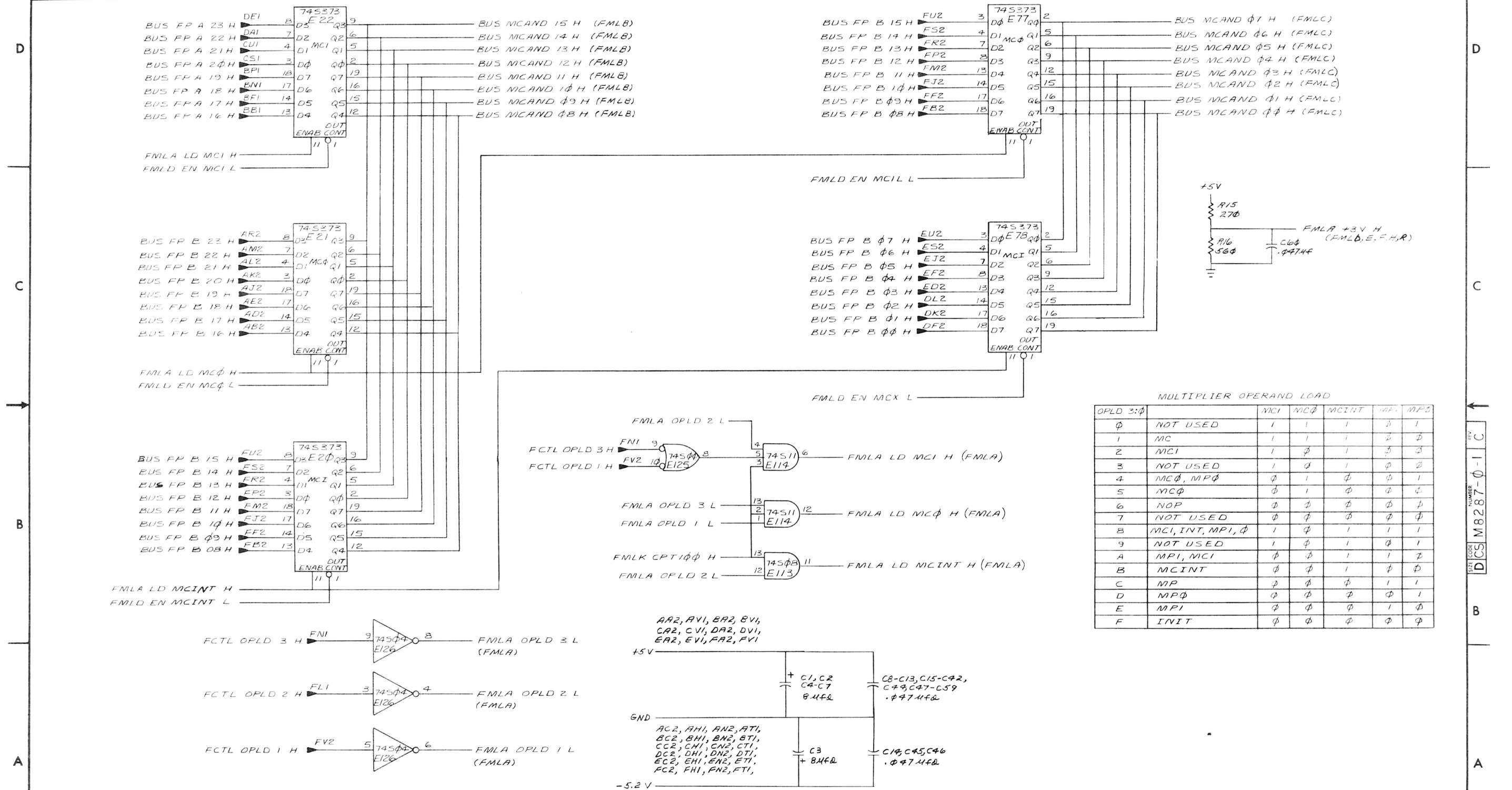
FML - CPU SIGNAL NAME TRANSLATION TABLE	
SIGNAL NAME	C.S. PAGE USED ON
ICLW ID LEFT ADDR 0 H	FMLP
ICLW ID LEFT WRITE L	FMLP



REV.	CHG.	NO.	DATE	BY	CHK.
1	1	1	10/1/77	A. HELENUS	
2	2	2	10/1/77	S. LACKY	
3	3	3	10/1/77	S. LACKY	
4	4	4	10/1/77	S. LACKY	
5	5	5	10/1/77	S. LACKY	
6	6	6	10/1/77	S. LACKY	
7	7	7	10/1/77	S. LACKY	
8	8	8	10/1/77	S. LACKY	

DRN. J. Vincent 9-22-77		FIRST USED ON	
CHK'D J. Vincent 10-19-77		FP780	
ENG. J. Vincent 10-19-77		TITLE	
PROJ. ENG. J. Vincent 10-19-77		FRACT MUL LOW	
PROD. J. Vincent 10-24-77		(FML)	
NEXT HIGHER ASSY.			
B-DD-M8287-0-0		SIZE	CODE
SCALE		D	CS
SHEET 1 OF 15		NUMBER	REV.
		M8287-0-1	C

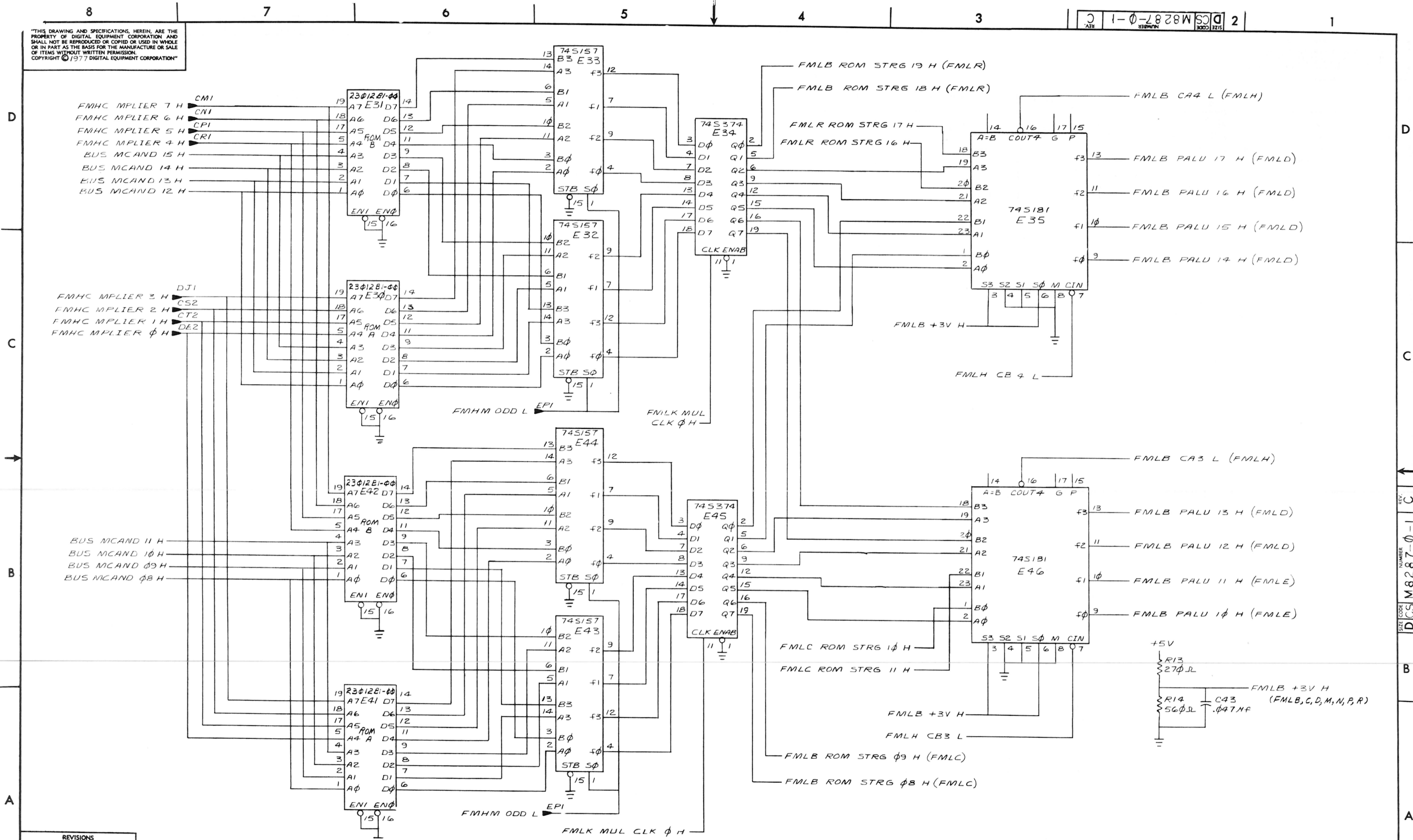
"THIS DRAWING AND SPECIFICATIONS, HEREIN, ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION. COPYRIGHT © 1977 DIGITAL EQUIPMENT CORPORATION"



MULTIPLIER OPERAND LOAD					
OPLD 3:0		MCI	MCφ	MCINT	MPI, MPφ
0	NOT USED	1	1	1	φ
1	MC	1	1	1	φ
2	MCI	1	φ	1	φ
3	NOT USED	1	φ	1	φ
4	MCφ, MPφ	φ	1	φ	φ
5	MCφ	φ	1	φ	φ
6	NOP	φ	φ	φ	φ
7	NOT USED	φ	φ	φ	φ
8	MCI, INT, MPI, φ	1	φ	1	1
9	NOT USED	1	φ	1	φ
A	MPI, MCI	φ	φ	1	φ
B	MCINT	φ	φ	1	φ
C	MP	φ	φ	φ	1
D	MPφ	φ	φ	φ	1
E	MPI	φ	φ	φ	1
F	INIT	φ	φ	φ	φ

"THIS DRAWING AND SPECIFICATIONS, HEREIN, ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION.
COPYRIGHT © 1977 DIGITAL EQUIPMENT CORPORATION"

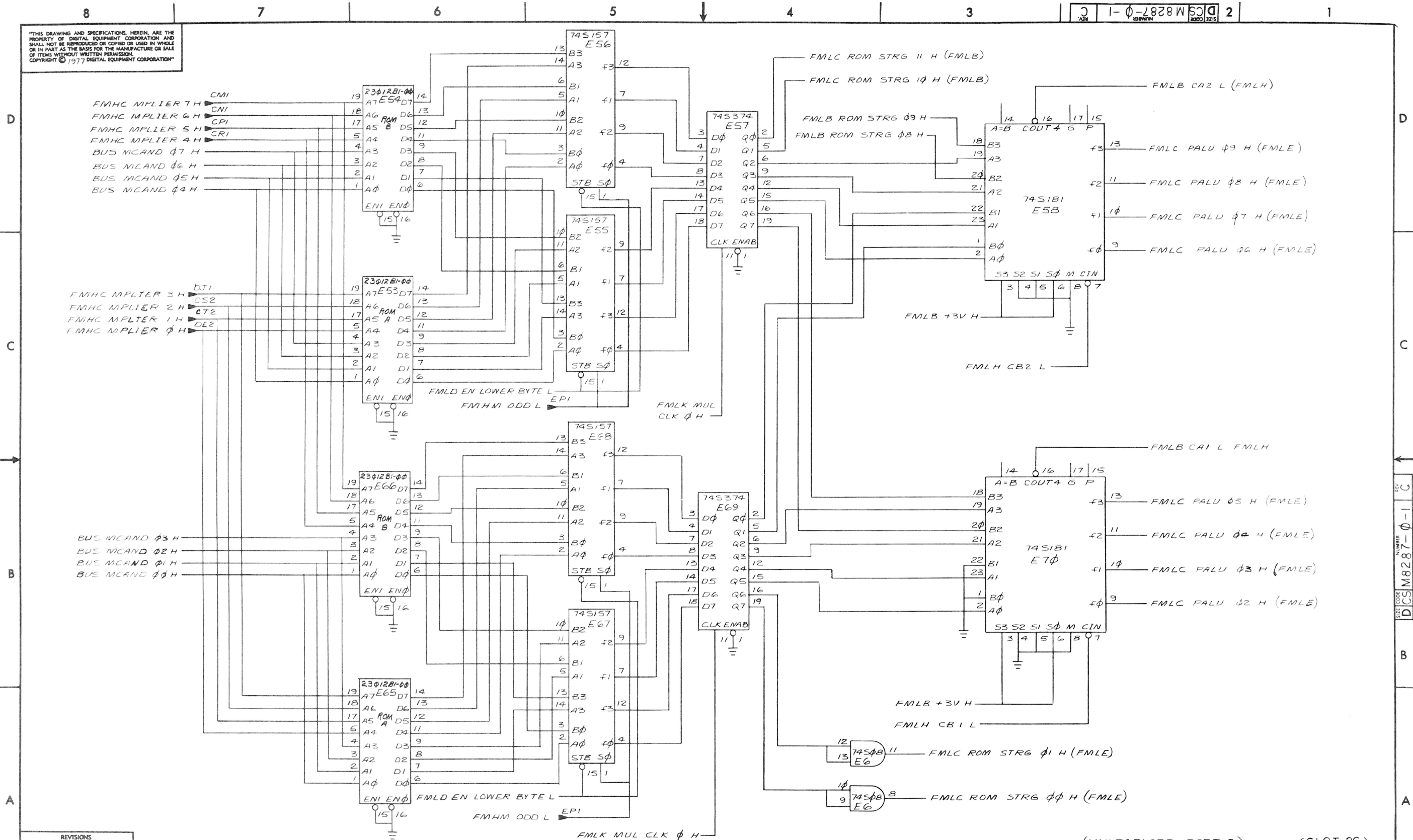
1-0-2828W 2



REVISIONS		
CHK	CHANGE NO.	REV.

(MULTIPLIER PIPE 1) (SLOT 26)
TITLE: FRACT MUL LOW (FMLB)
SCALE: 1/16" = 1"
SHEET: 3 OF 15
NUMBER: DCS M8287-0-1
REV: C

"THIS DRAWING AND SPECIFICATIONS, HEREIN, ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION.
COPYRIGHT © 1977 DIGITAL EQUIPMENT CORPORATION"



REVISIONS		
CHK	CHANGE NO.	REV.

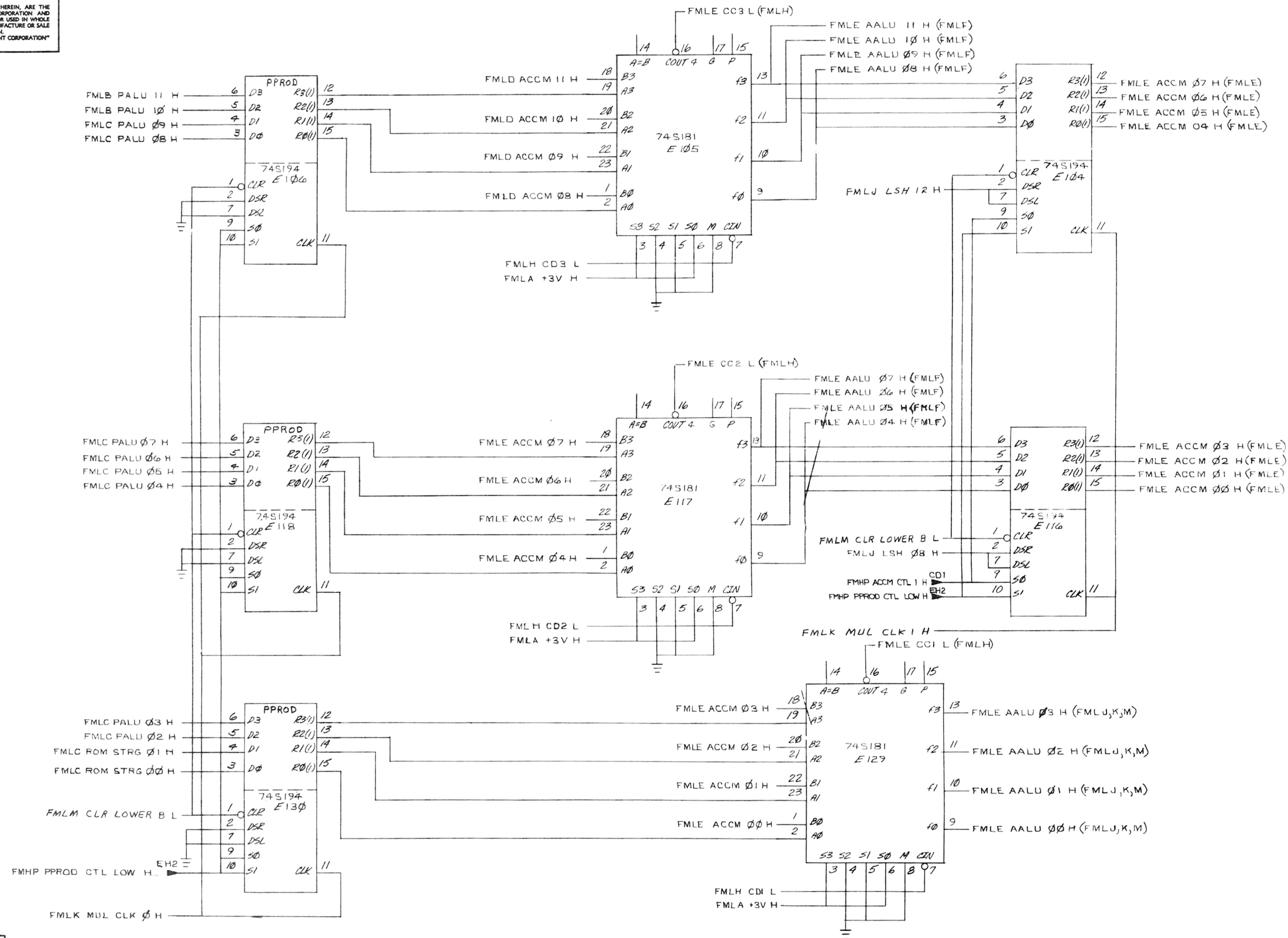
(MULTIPLIER PIPE 2)		(SLOT 26)	
TITLE		SIZE CODE	NUMBER
FRAC MUL LOW		DCS	M8287-0-1
SCALE		SHEET 4 OF 15	DIST.

REV. C
NUMBER DCS M8287-0-1
SIZE CODE



(MULTIPLIER PIPE 3)				(SLOT 26)			
TITLE (FM LD)			SIZE CODE		NUMBER		REV
FRACT MUL LOW			D CS		M8287-Ø-1		C
SCALE	— / —	SHEET	5	OF	15	DIST.	

"THIS DRAWING AND SPECIFICATIONS, HEREIN, ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION. COPYRIGHT © 1977 DIGITAL EQUIPMENT CORPORATION"



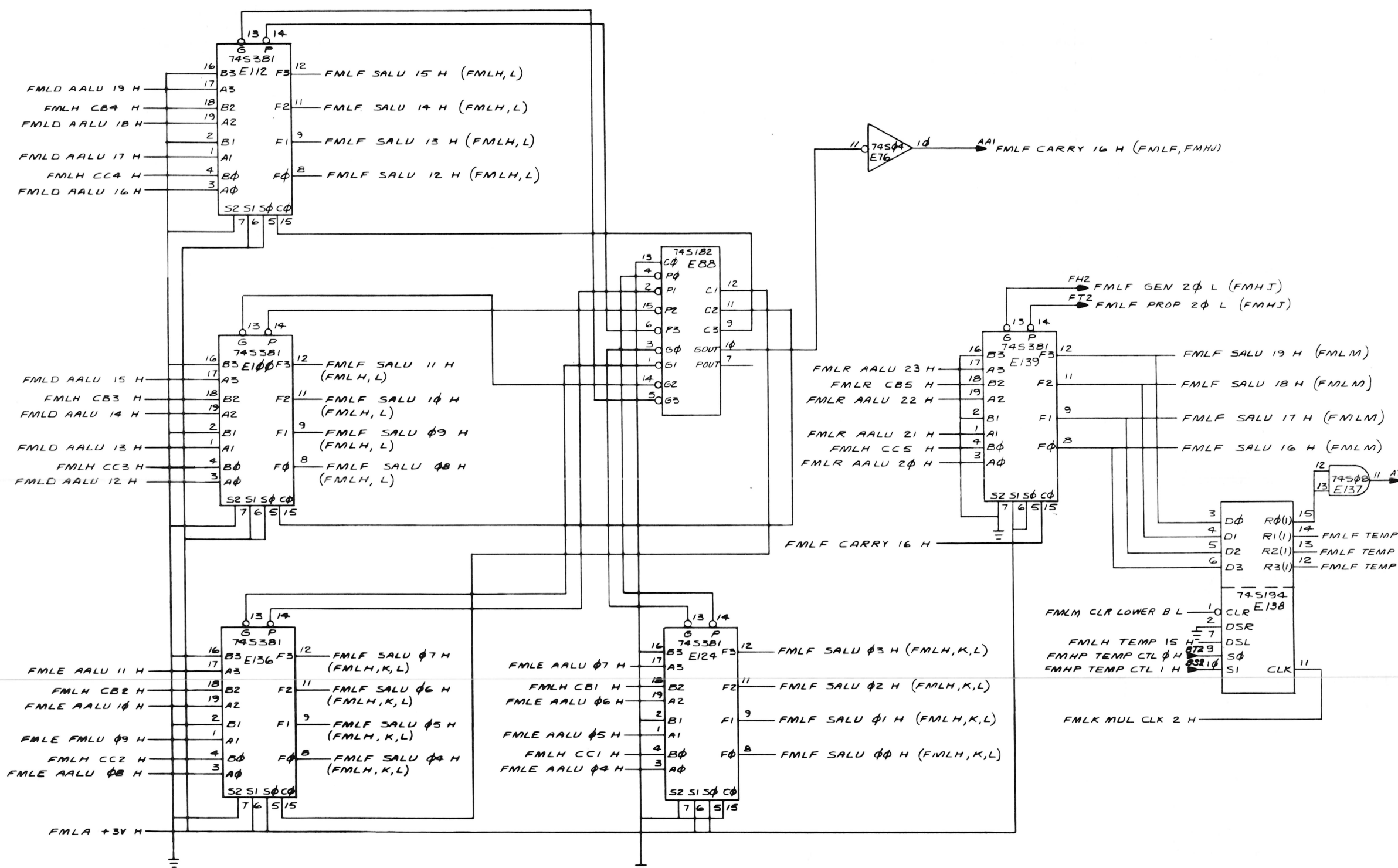
REVISIONS		
CHK	CHANGE NO.	REV.

(MULTIPLIER PIPE 4)

(SLOT 26)

TITLE FRACT MUL LOW (FMLE)		SIZE D	CODE CS	NUMBER M8287-Ø-1	REV. C
SCALE 1/4"	SHEET 6 OF 15	DIST.			

"THIS DRAWING AND SPECIFICATIONS HEREIN ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION. COPYRIGHT © 1977 DIGITAL EQUIPMENT CORPORATION"

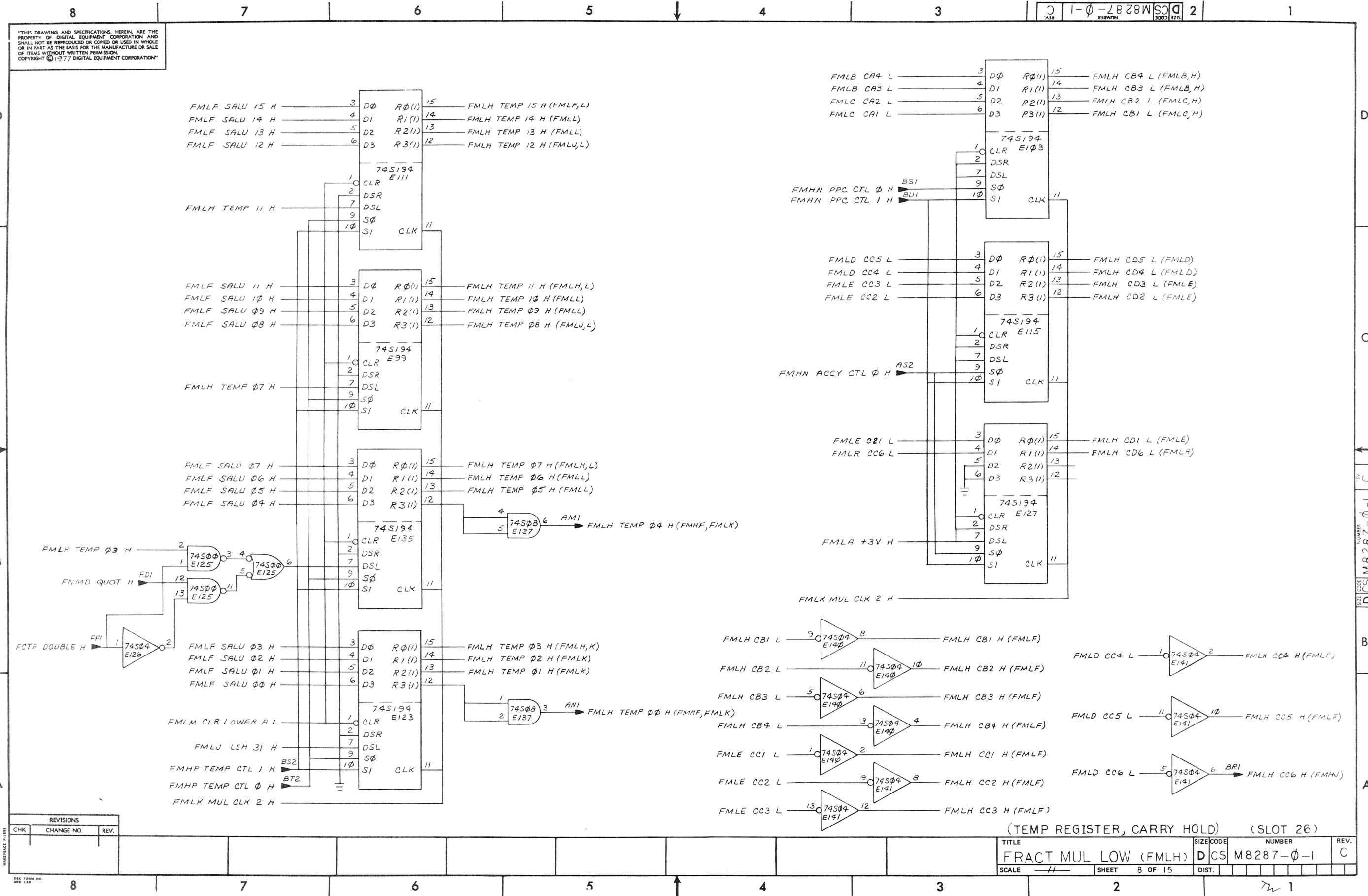


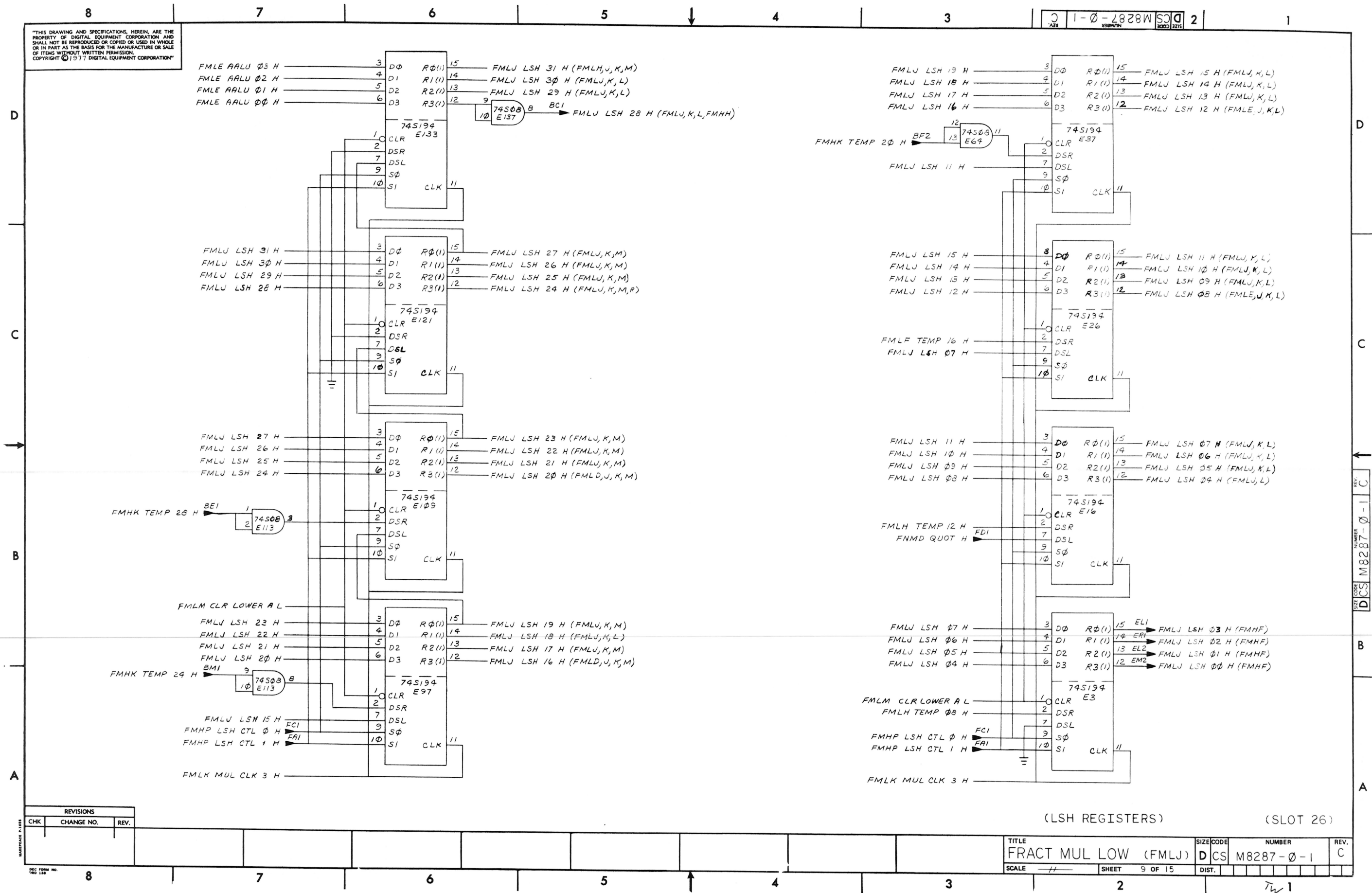
REVISIONS		
CHK	CHANGE NO.	REV.

(LEAST SIGNIFICANT HALF OF ADDER) (SLOT 26)

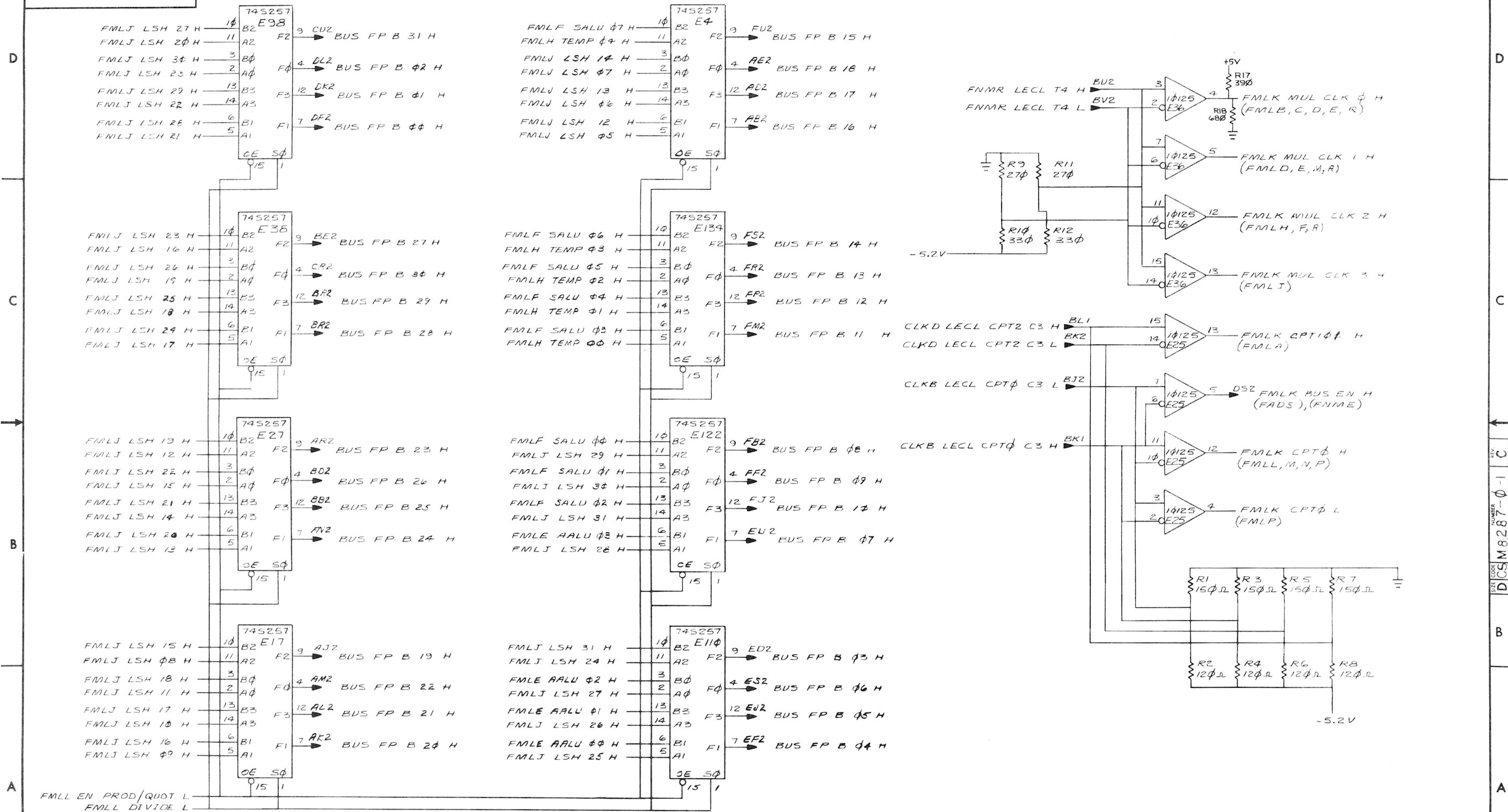
TITLE	FRAC MUL LOW (FMLF)	SIZE CODE	NUMBER	REV.
SCALE	1/1	SHEET	7 OF 15	DIST.

REV. C
NUMBER
DCE M8287-0-1





"THIS DRAWING AND SPECIFICATIONS, HEREIN, ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION.
COPYRIGHT © 1977 DIGITAL EQUIPMENT CORPORATION"



REVISIONS		
CHK	CHANGE NO.	REV.

MAINTENANCE P. 1885

DEC FORM NO. 10 130

8

7

6

5

4

3

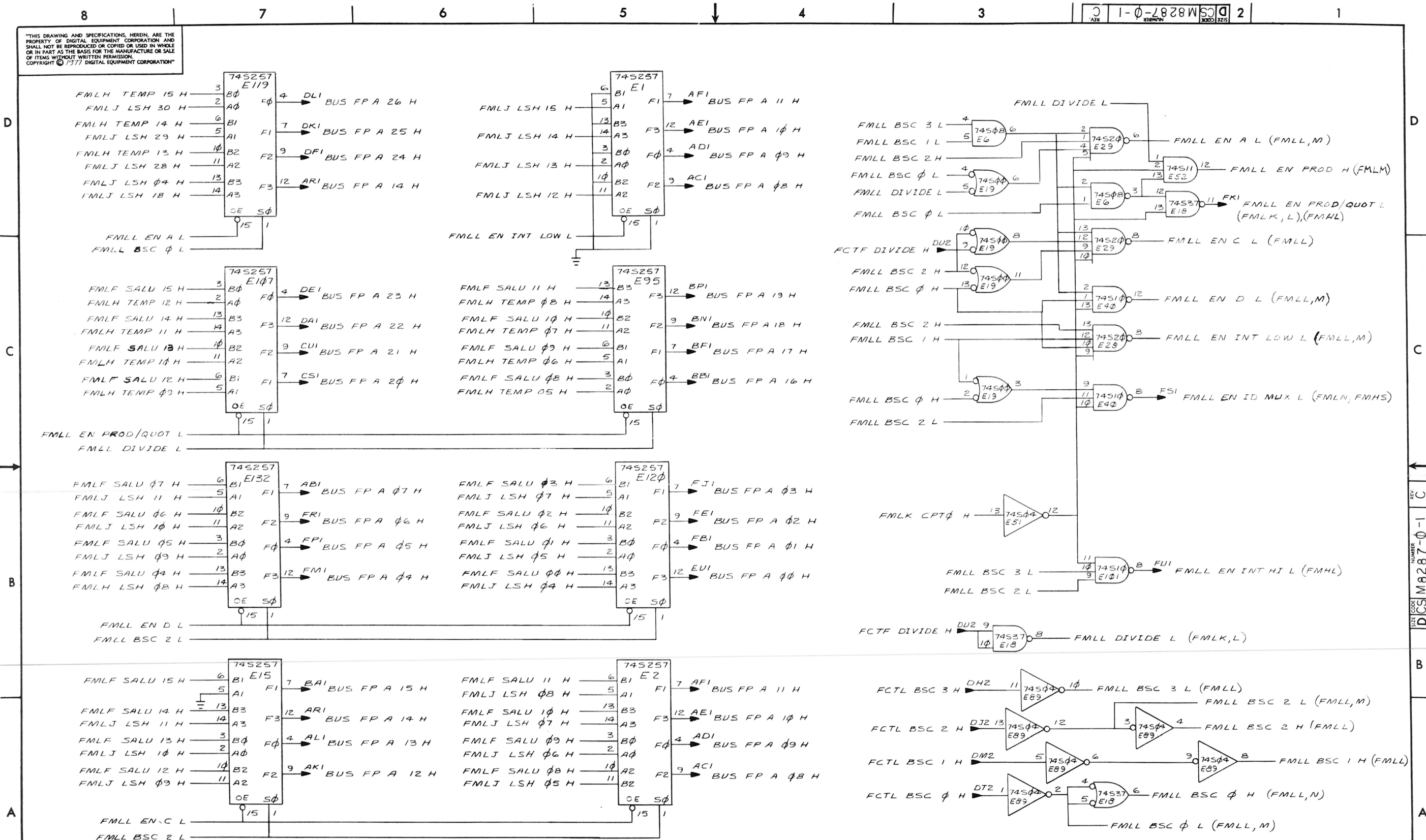
2

1

(BUS B SELECTOR/DRIVER)		(SLOT 26)	
TITLE	FRAC T MUL LOW	SIZE CODE	D CS
NUMBER	M 8287-0-1	REV.	C
SCALE	1:1	SHEET	10 OF 15
DIST.			

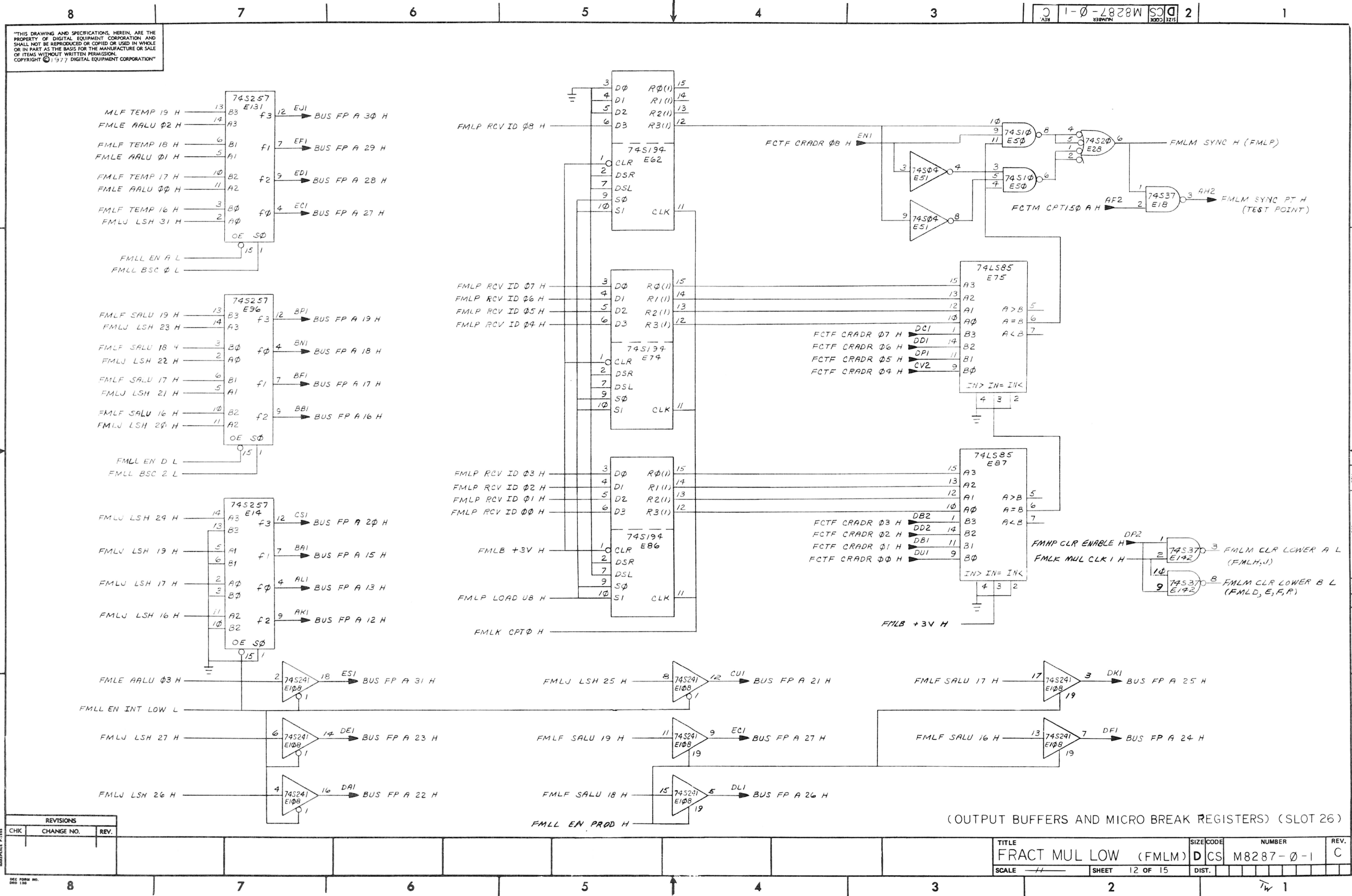
7.1

THIS DRAWING AND SPECIFICATIONS, HEREIN, ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION. COPYRIGHT © 1977 DIGITAL EQUIPMENT CORPORATION



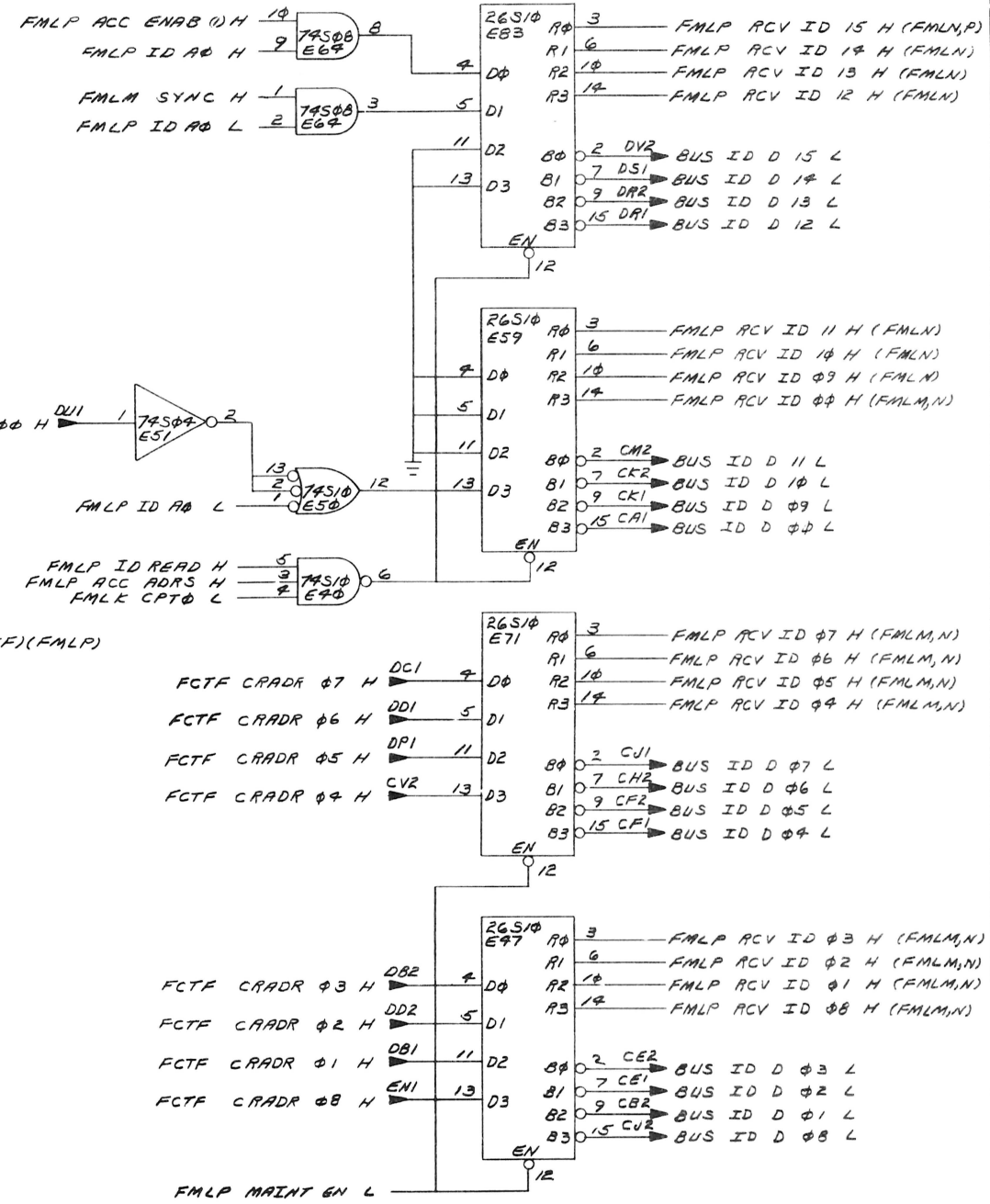
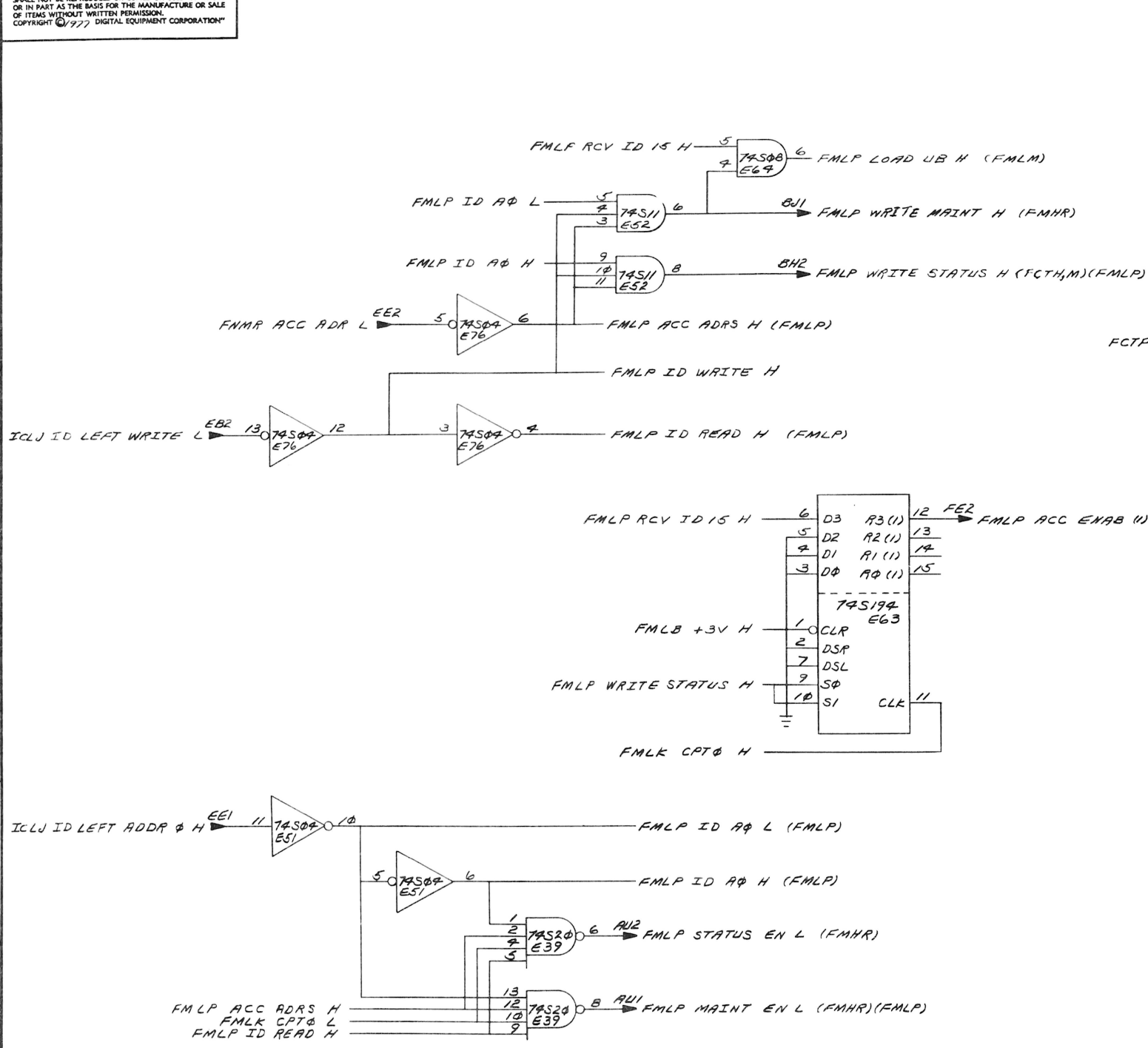
REVISIONS		
CHK	CHANGE NO.	REV.

TITLE		SIZE CODE		NUMBER		REV.	
FRACT MUL LOW		DCS		M8287-0-1		C	
SCALE		SHEET 11 OF 15		DIST.			



THIS DRAWING AND SPECIFICATIONS, HEREIN, ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION, AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION.
COPYRIGHT © 1977 DIGITAL EQUIPMENT CORPORATION

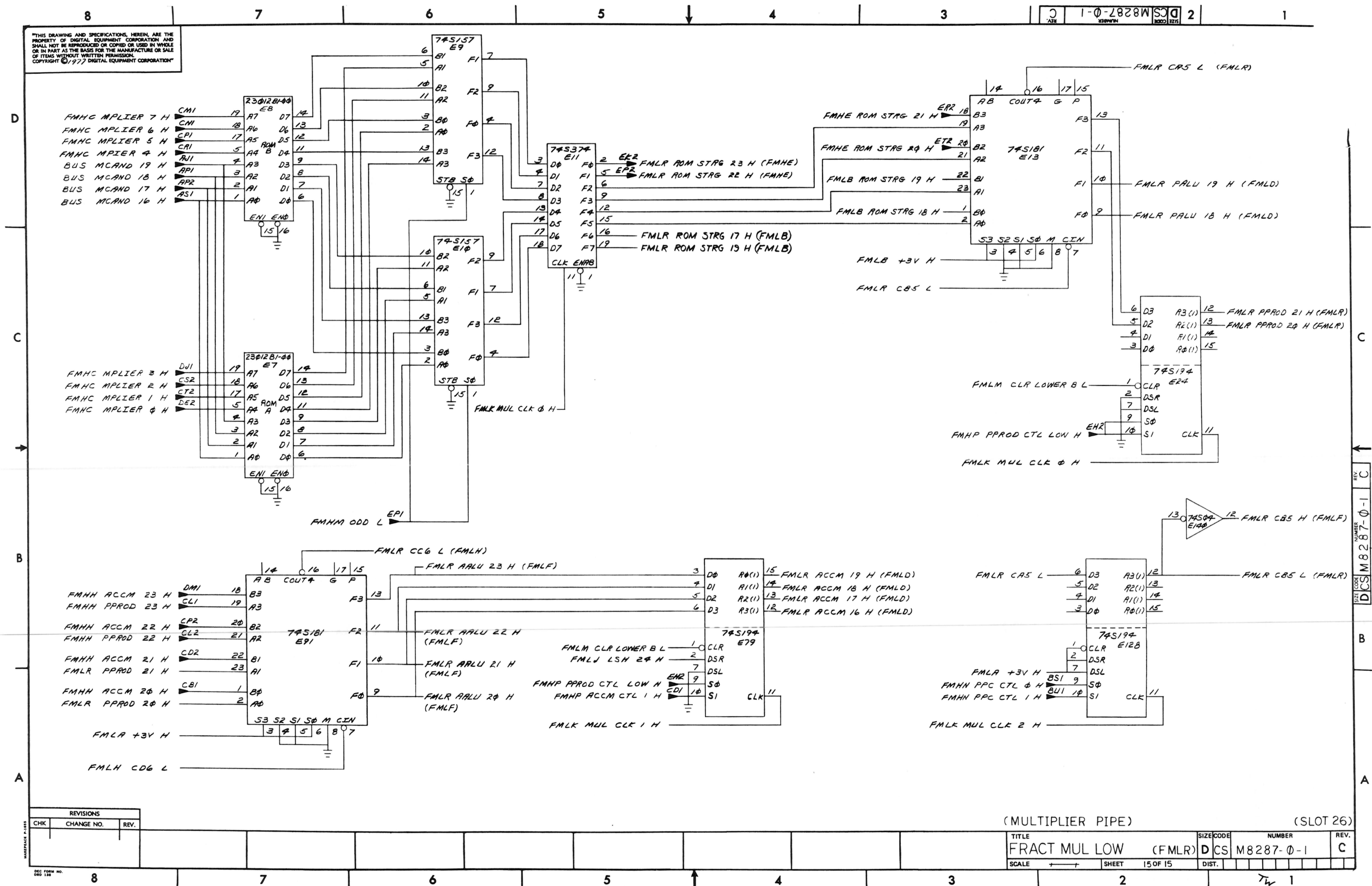
D
C
B
A



D
C
B
A

REVISIONS		
CHK	CHANGE NO.	REV.

(ID BUS INTERFACE)			(SLOT 26)		
TITLE	FRACT MUL LOW (FMLP)	SIZE CODE	D CS	NUMBER	M8287-0-1
SCALE	1/4 OF 15	SHEET	14 OF 15	DIST.	



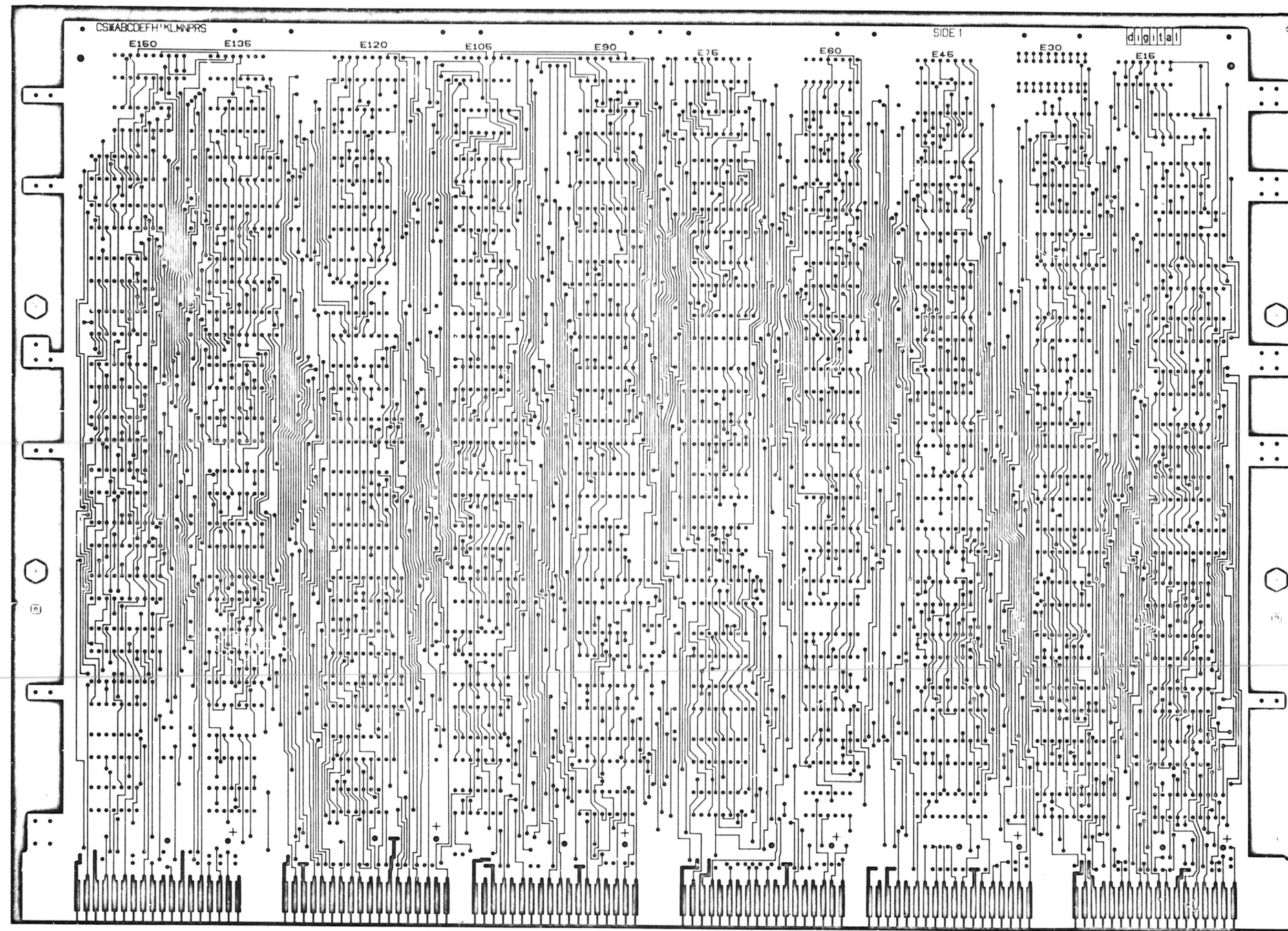


CHK	CHANGE	NO	REV
-----	--------	----	-----

NOTES:

THIS DRAWING AND SPECIFICATIONS HEREBY ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR USED IN ANY MANNER OR FOR ANY PURPOSE WITHOUT THE WRITTEN PERMISSION OF DIGITAL EQUIPMENT CORPORATION.

5013085A
M8288A LAYER 1



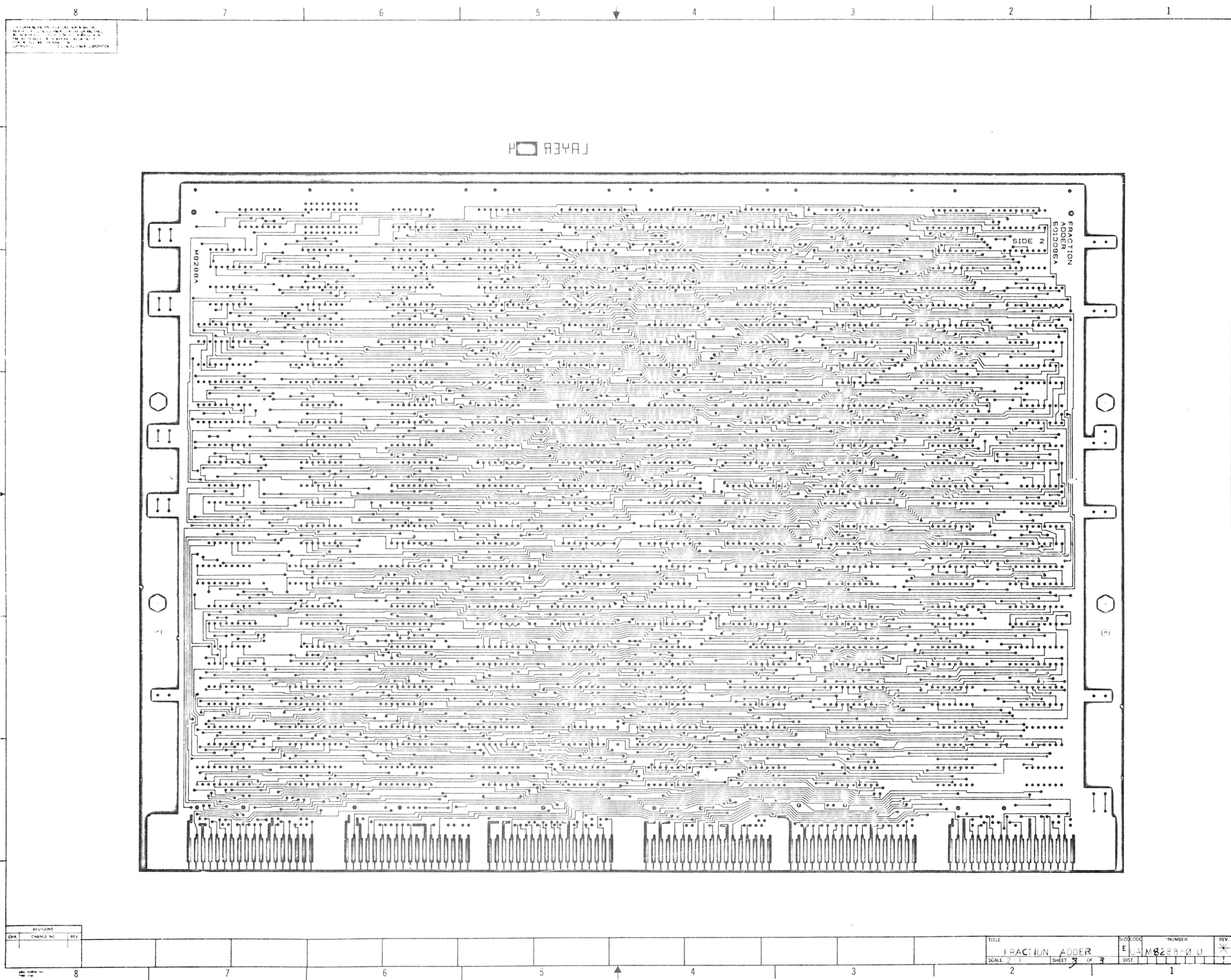
REVISIONS		
CHR	CHANGE NO	REV

DEC FORM NO 108 108

TITLE
FRACTION ADDER
SCALE 1:1 SHEET 27 OF 3

SIZE/COOL NUMBER
EUA M8288 0-0
DIST

REV
*



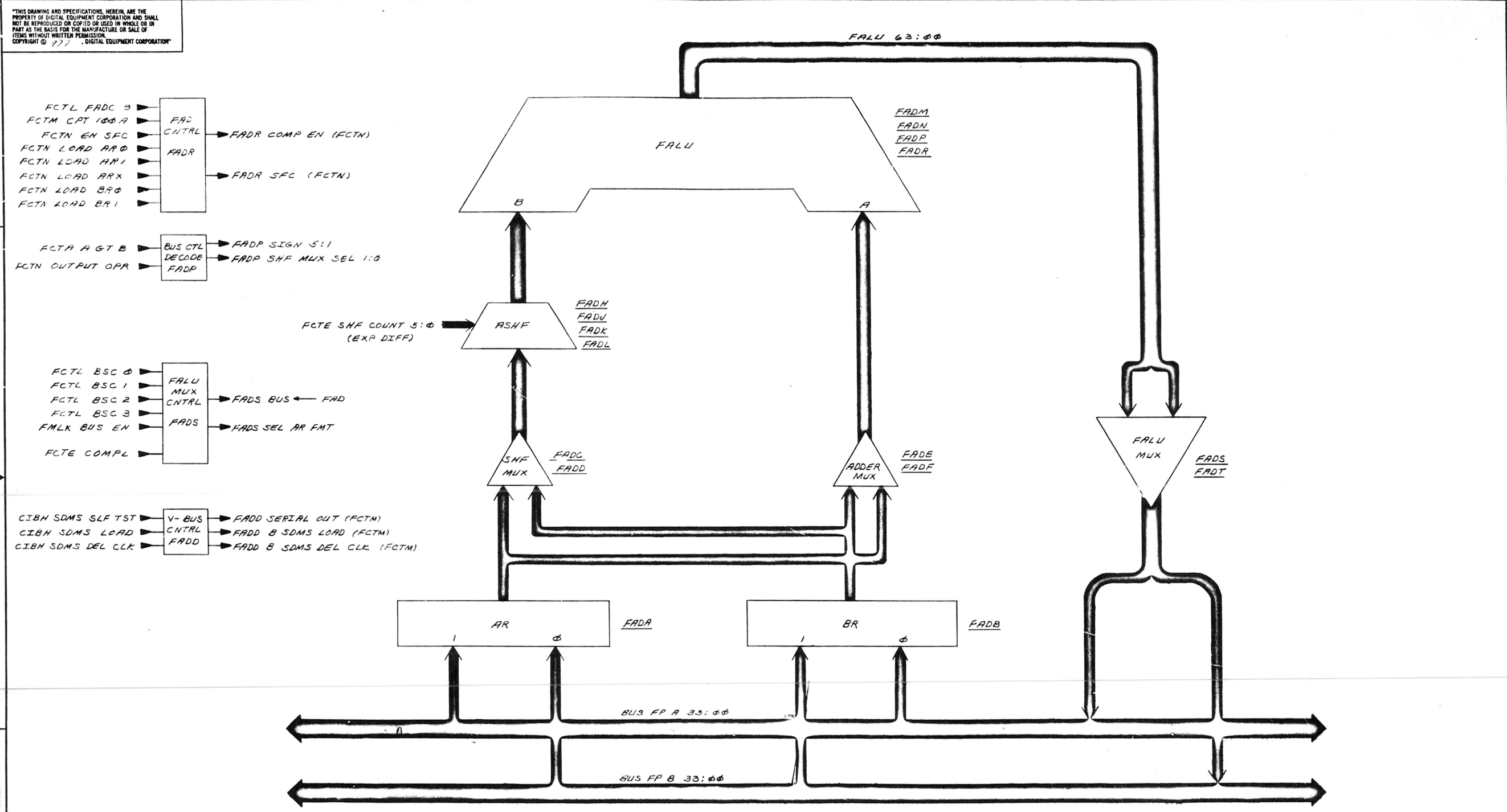
P 834AJ

REVISIONS		
CHK	CHANGE NO.	REV

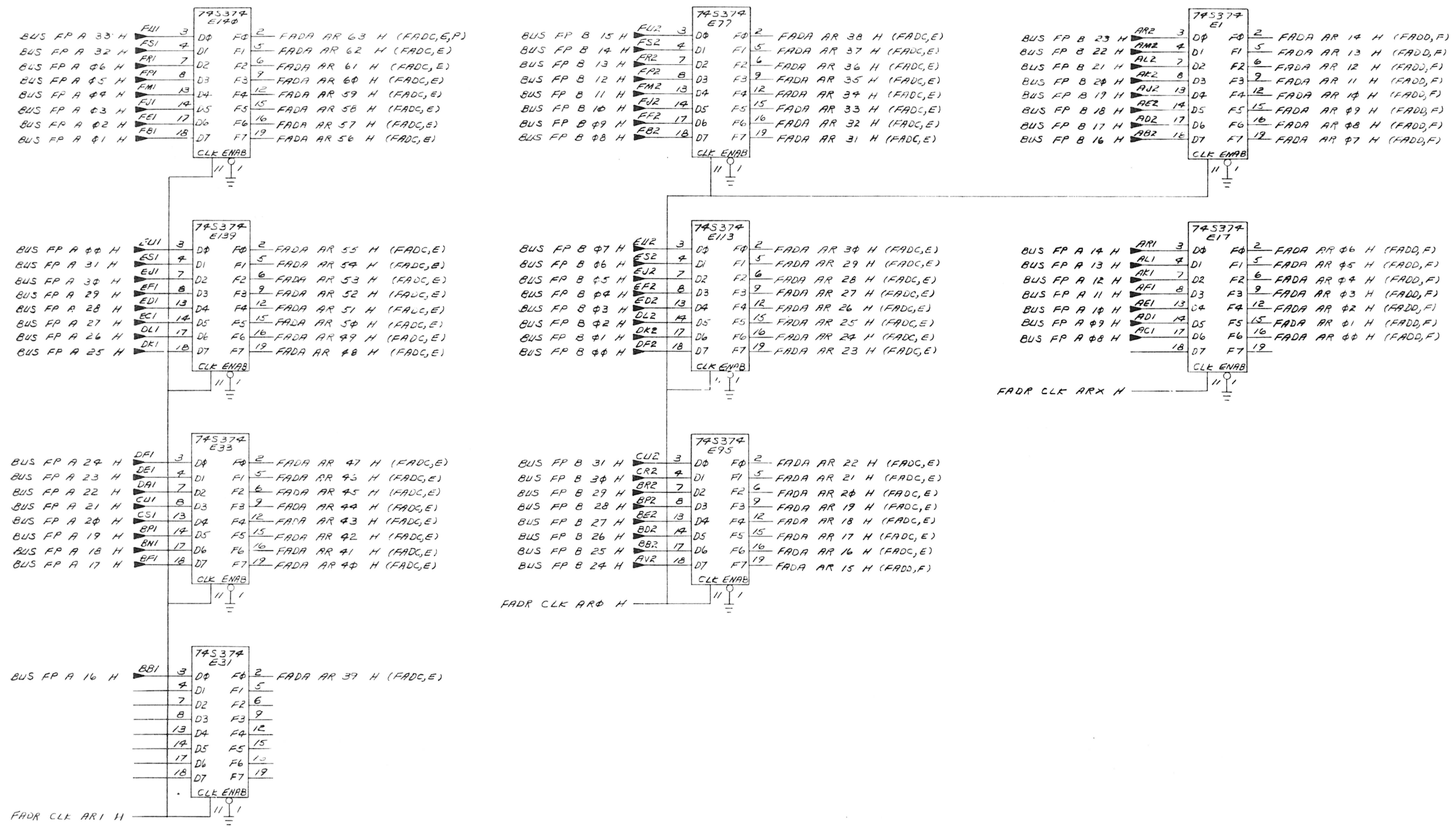
TITLE		SIZE	CODE	NUMBER	REV
FRACTION ADDER		E	A	M8288-00	*
SCALE 2-1		SHEET 3 OF 3		DIST	

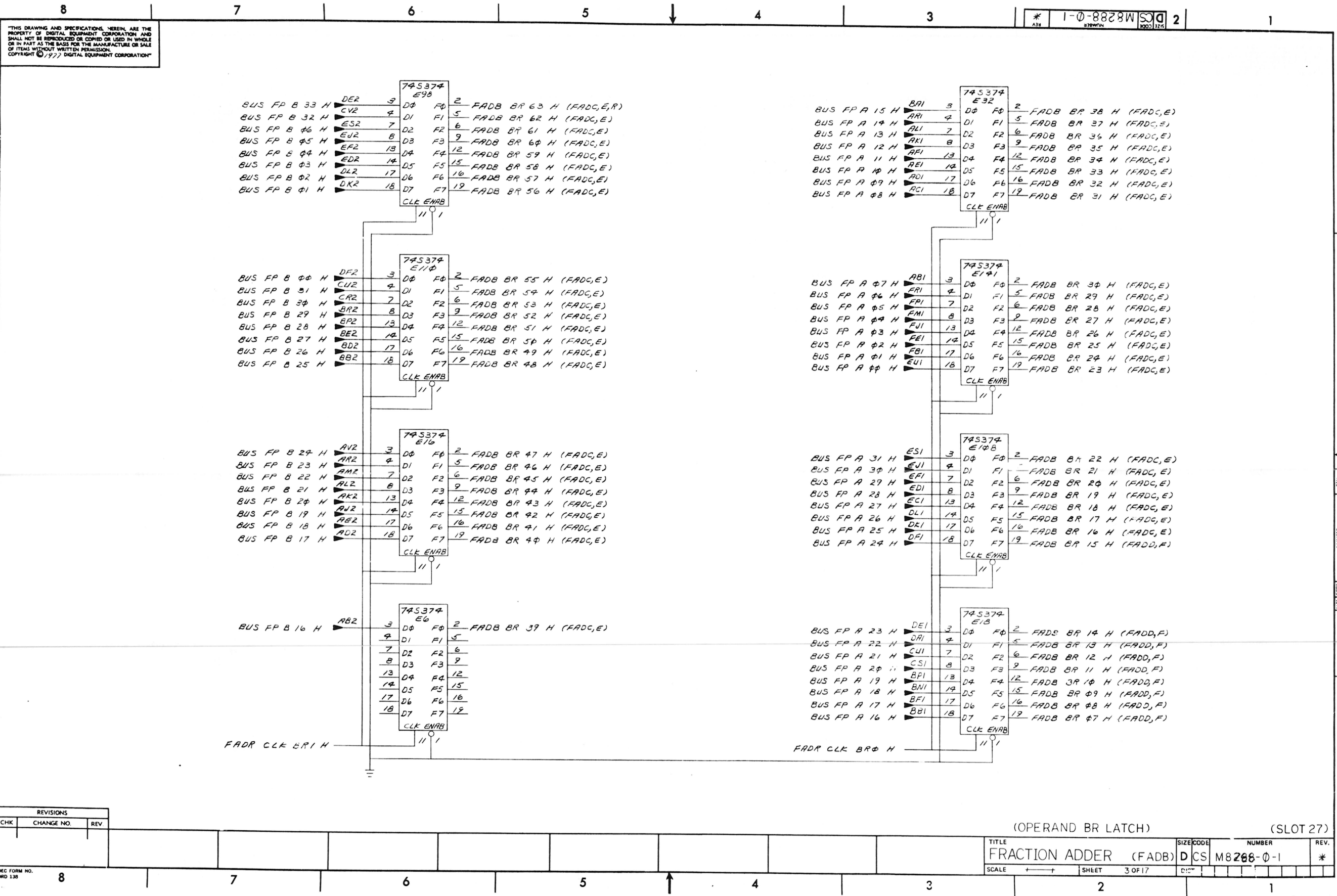
DIGITAL EQUIPMENT CORPORATION				PARTS LIST															
MADE BY D. BILODEAU DATE 27 JUNE 77		CHECKED <i>Frank Smart</i> DATE 9-27-77		SECTION															
ENG <i>Slackay</i> DATE 9-30-77		PROD <i>Mike Tulla</i> DATE 9-27-77		ISSUED SECTION															
ITEM NO.	DRAWING NO.	PART NO.	DESCRIPTION	M8288-0-0													REF DESIGNATION		
1	D-MD-5013085-0-0	5013085	ETCH BOARD																
2		1012784	CAPACITOR, .047 uf 50V	33													C1,C8 thru C24,C26,C28 thru C31,C34 thru C43		
3		1012084-01	CAPACITOR, 8 uf 25 W	6													C2 thru C7		
4		1301890	RESISTOR, 560 OHM, 1/4W, 5%	2													R3,R4		
5		1301972	RESISTOR, 270 OHM, 1/4W, 5%	2													R1,R2		
6		1910532	I.C. DEC 74S00	3													E106, E121, E137		
7		1910534	I.C. DEC 74S04	1													E91		
8		1912389	I.C. DEC 74S08	1													E136		
9		1910536	I.C. DEC 74S10	1													E94		
10		1912746	I.C. DEC 74S37	2													E79,E81		
11		1910541	I.C. DEC 74S40	1													E122		
12		1910545	I.C. DEC 74S112	1													E76		
13		1910548	I.C. DEC 74S157	32													E2,E3,E9,E19, E20, E22 thru E25,E34,E35, E39, E47,E49,E62,E64,E82,E90, E96,E99,E105,E111, E112,E114,E125 thru E129,E145,E146, 142		
14		1913839	I.C. DEC 74LS165	3													E107,E109,E115		
15		1912097	I.C. DEC 74S182	5													E13,E66, E86, E117,E135		
16		1911641	I.C. DEC 74S257	17													E5, E7,E8,E4,E48, E61,E63,E74, E75, E78, E93, E92,E123,E124,E138, E144, E143		
17		1913671	I.C. DEC 74S374	17													E1, E6, E16,E17,E18, E31,E32, E33, E77, E95, E98, E110, E113, E108, E139, E140, E141		
18		1913700	I.C. DEC 74S381	16													E10, E11, E12, E21, E26, E36, E80, E97, E65, E120, E130 thru E133, E147, E150		
E.C.O. NO.																			
"THIS DRAWING AND SPECIFICATIONS, HEREIN, ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION. COPYRIGHT © DIGITAL EQUIPMENT CORPORATION"				TITLE FRACTION ADDER				ASSY NO. E-UA-M8288-0-0				SIZE B		CODE PL		NUMBER M8288-0-0		REV. *	
								SHEET 1 OF 2				INSERTION PARTS LIST DATA BASE REV							

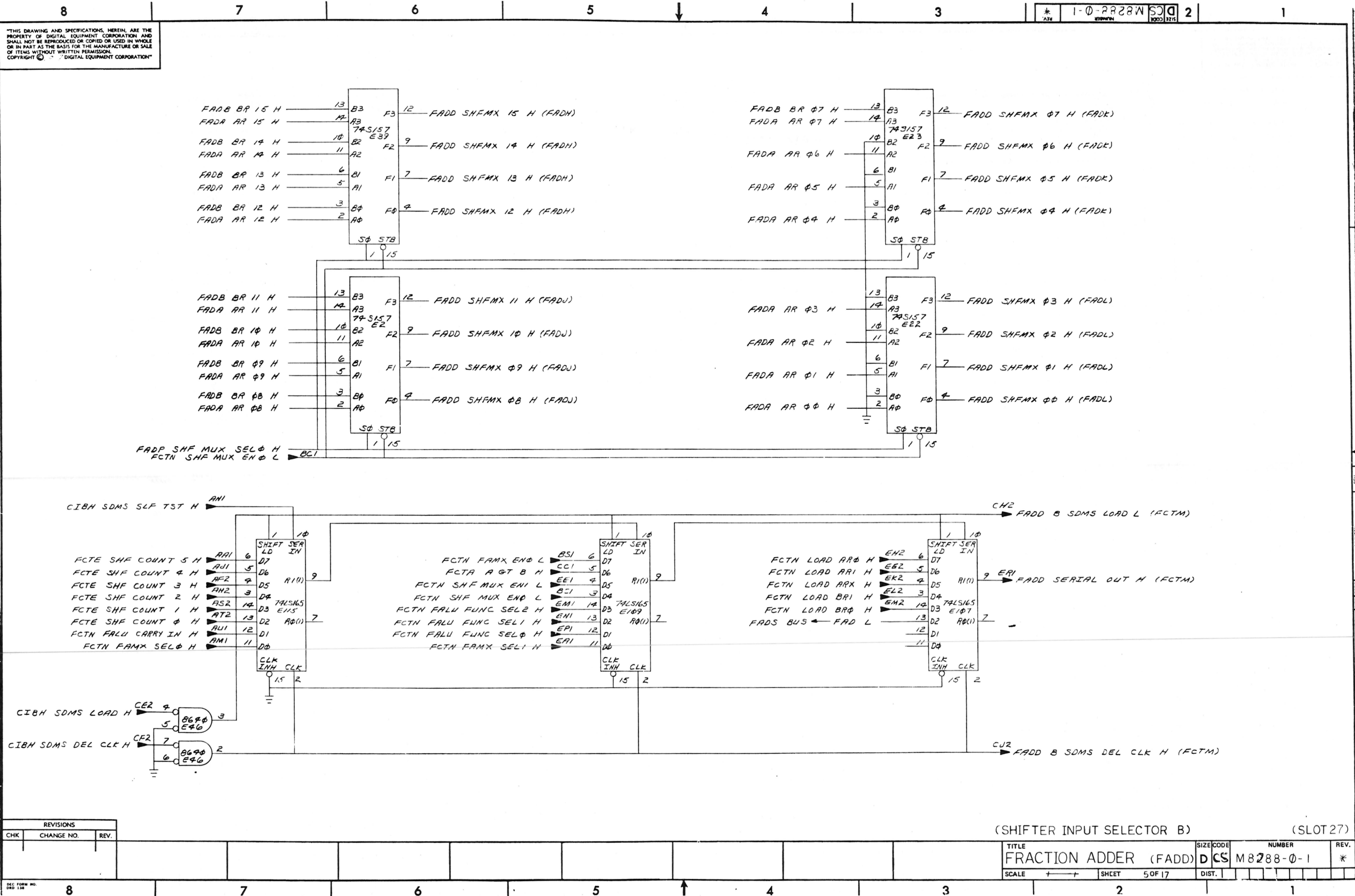
DIGITAL EQUIPMENT CORPORATION PARTS LIST				QUANTITY / VARIATION												NOTES:									
MADE BY DATE		D. BILODEAU 27 JUNE 77		CHECKED DATE		<i>Frank Smart</i> 9-27-77		SECTION																	
ENG DATE		S Lachay 9-30-77		PROD DATE		Mike Tuller 9-27-77		ISSUED SECTION														REF DESIGNATION			
ITEM NO.		DRAWING NO.		PART NO.		DESCRIPTION		M8288-0-0																	
19				1911469		I.C. DEC 8640		1														E46 E14,E15,E27,E28,E29,E37,E38,E40,E41,E42, E43,E45,E44,E50 thru E60,E67 thru E73 E83,E84,E85,E87,E88,E89,E100 thru E104 E116,E118,E119,E134,E148,E149			
20				1912693		I.C. DEC 25S10		48																	
21				1210711-02		HANDLE		1																	
22				900002401		EYE LET		12																	
E.C.O. NO.																									
"THIS DRAWING AND SPECIFICATIONS, HEREIN, ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION. COPYRIGHT © DIGITAL EQUIPMENT CORPORATION"								TITLE FRACTION ADDER				ASSY NO. D-UA-M8288-0-0				SIZE B		CODE PL		NUMBER M8288-0-0				REV. *	
												SHEET 2 OF 2				INSERTION PARTS LIST DATA BASE REV									



THIS DRAWING AND SPECIFICATIONS HEREIN ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION.
COPYRIGHT © 1977 DIGITAL EQUIPMENT CORPORATION







"THIS DRAWING AND SPECIFICATIONS, HEREIN, ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION. COPYRIGHT © 1977 DIGITAL EQUIPMENT CORPORATION"

FADA AR 63 H — 13 B3 F3 12 — FADE FAMX 63 H (FADM)
FADB BR 63 H — 14 A3 74S157
FADA AR 62 H — 10 B2 E142 9 — FADE FAMX 62 H (FADM)
FADB BR 62 H — 11 A2
FADA AR 61 H — 6 B1 F1 7 — FADE FAMX 61 H (FADM)
FADB BR 61 H — 5 A1
FADA AR 60 H — 3 B0 F0 4 — FADE FAMX 60 H (FADM)
FADB BR 60 H — 2 A0
S0 STB
1 15

FADA AR 47 H — 13 B3 F3 12 — FADE FAMX 47 H (FADM)
FADB BR 47 H — 14 A3 74S157
FADA AR 46 H — 10 B2 E35 9 — FADE FAMX 46 H (FADM)
FADB BR 46 H — 11 A2
FADA AR 45 H — 6 B1 F1 7 — FADE FAMX 45 H (FADM)
FADB BR 45 H — 5 A1
FADA AR 44 H — 3 B0 F0 4 — FADE FAMX 44 H (FADM)
FADB BR 44 H — 2 A0
S0 STB
1 15

FADA AR 31 H — 13 B3 F3 12 — FADE FAMX 31 H (FADM)
FADB BR 31 H — 14 A3 74S157
FADA AR 30 H — 10 B2 E140 9 — FADE FAMX 30 H (FADM)
FADB BR 30 H — 11 A2
FADA AR 29 H — 6 B1 F1 7 — FADE FAMX 29 H (FADM)
FADB BR 29 H — 5 A1
FADA AR 28 H — 3 B0 F0 4 — FADE FAMX 28 H (FADM)
FADB BR 28 H — 2 A0
S0 STB
1 15

FADA AR 59 H — 13 B3 F3 12 — FADE FAMX 59 H (FADM)
FADB BR 59 H — 14 A3 74S157
FADA AR 58 H — 10 B2 E105 9 — FADE FAMX 58 H (FADM)
FADB BR 58 H — 11 A2
FADA AR 57 H — 6 B1 F1 7 — FADE FAMX 57 H (FADM)
FADB BR 57 H — 5 A1
FADA AR 56 H — 3 B0 F0 4 — FADE FAMX 56 H (FADM)
FADB BR 56 H — 2 A0
S0 STB
1 15

FADA AR 43 H — 13 B3 F3 12 — FADE FAMX 43 H (FADM)
FADB BR 43 H — 14 A3 74S157
FADA AR 42 H — 10 B2 E20 9 — FADE FAMX 42 H (FADM)
FADB BR 42 H — 11 A2
FADA AR 41 H — 6 B1 F1 7 — FADE FAMX 41 H (FADM)
FADB BR 41 H — 5 A1
FADA AR 40 H — 3 B0 F0 4 — FADE FAMX 40 H (FADM)
FADB BR 40 H — 2 A0
S0 STB
1 15

FADA AR 27 H — 13 B3 F3 12 — FADE FAMX 27 H (FADM)
FADB BR 27 H — 14 A3 74S157
FADA AR 26 H — 10 B2 E120 9 — FADE FAMX 26 H (FADM)
FADB BR 26 H — 11 A2
FADA AR 25 H — 6 B1 F1 7 — FADE FAMX 25 H (FADM)
FADB BR 25 H — 5 A1
FADA AR 24 H — 3 B0 F0 4 — FADE FAMX 24 H (FADM)
FADB BR 24 H — 2 A0
S0 STB
1 15

FADA AR 55 H — 13 B3 F3 12 — FADE FAMX 55 H (FADM)
FADB BR 55 H — 14 A3 74S157
FADA AR 54 H — 10 B2 E127 9 — FADE FAMX 54 H (FADM)
FADB BR 54 H — 11 A2
FADA AR 53 H — 6 B1 F1 7 — FADE FAMX 53 H (FADM)
FADB BR 53 H — 5 A1
FADA AR 52 H — 3 B0 F0 4 — FADE FAMX 52 H (FADM)
FADB BR 52 H — 2 A0
S0 STB
1 15

FADA AR 39 H — 13 B3 F3 12 — FADE FAMX 39 H (FADM)
FADB BR 39 H — 14 A3 74S157
FADA AR 38 H — 10 B2 E62 9 — FADE FAMX 38 H (FADM)
FADB BR 38 H — 11 A2
FADA AR 37 H — 6 B1 F1 7 — FADE FAMX 37 H (FADM)
FADB BR 37 H — 5 A1
FADA AR 36 H — 3 B0 F0 4 — FADE FAMX 36 H (FADM)
FADB BR 36 H — 2 A0
S0 STB
1 15

FADA AR 21 H — 13 B3 F3 12 — FADE FAMX 23 H (FADM)
FADB BR 23 H — 14 A3 74S157
FADA AR 22 H — 10 B2 E114 9 — FADE FAMX 22 H (FADM)
FADB BR 22 H — 11 A2
FADA AR 21 H — 6 B1 F1 7 — FADE FAMX 21 H (FADM)
FADB BR 21 H — 5 A1
FADA AR 20 H — 3 B0 F0 4 — FADE FAMX 20 H (FADM)
FADB BR 20 H — 2 A0
S0 STB
1 15

FADA AR 51 H — 13 B3 F3 12 — FADE FAMX 51 H (FADM)
FADB BR 51 H — 14 A3 74S157
FADA AR 50 H — 10 B2 E126 9 — FADE FAMX 50 H (FADM)
FADB BR 50 H — 11 A2
FADA AR 49 H — 6 B1 F1 7 — FADE FAMX 49 H (FADM)
FADB BR 49 H — 5 A1
FADA AR 48 H — 3 B0 F0 4 — FADE FAMX 48 H (FADM)
FADB BR 48 H — 2 A0
S0 STB
1 15

FADA AR 35 H — 13 B3 F3 12 — FADE FAMX 35 H (FADM)
FADB BR 35 H — 14 A3 74S157
FADA AR 34 H — 10 B2 E64 9 — FADE FAMX 34 H (FADM)
FADB BR 34 H — 11 A2
FADA AR 33 H — 6 B1 F1 7 — FADE FAMX 33 H (FADM)
FADB BR 33 H — 5 A1
FADA AR 32 H — 3 B0 F0 4 — FADE FAMX 32 H (FADM)
FADB BR 32 H — 2 A0
S0 STB
1 15

FADA AR 19 H — 13 B3 F3 12 — FADE FAMX 19 H (FADM)
FADB BR 19 H — 14 A3 74S157
FADA AR 18 H — 10 B2 E111 9 — FADE FAMX 18 H (FADM)
FADB BR 18 H — 11 A2
FADA AR 17 H — 6 B1 F1 7 — FADE FAMX 17 H (FADM)
FADB BR 17 H — 5 A1
FADA AR 16 H — 3 B0 F0 4 — FADE FAMX 16 H (FADM)
FADB BR 16 H — 2 A0
S0 STB
1 15

FCTN FAMX SEL 1 H
EAI

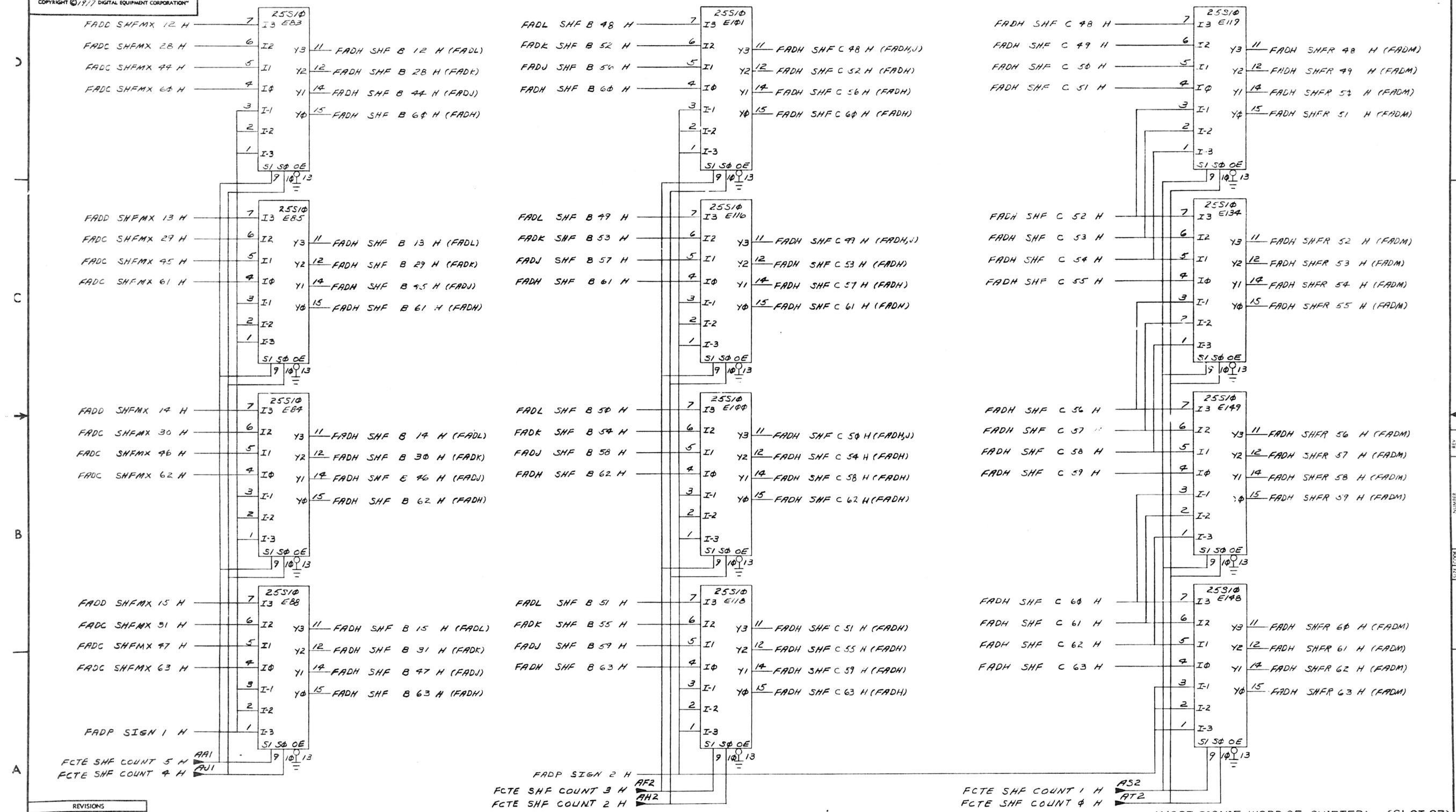
FCTN FAMX SEL 0 H
FCTN FAMX EN0 L
AMI
BSI

(ADDER INPUT SELECTOR A) (SLOT 27)

REVISIONS		
CHK	CHANGE NO.	REV

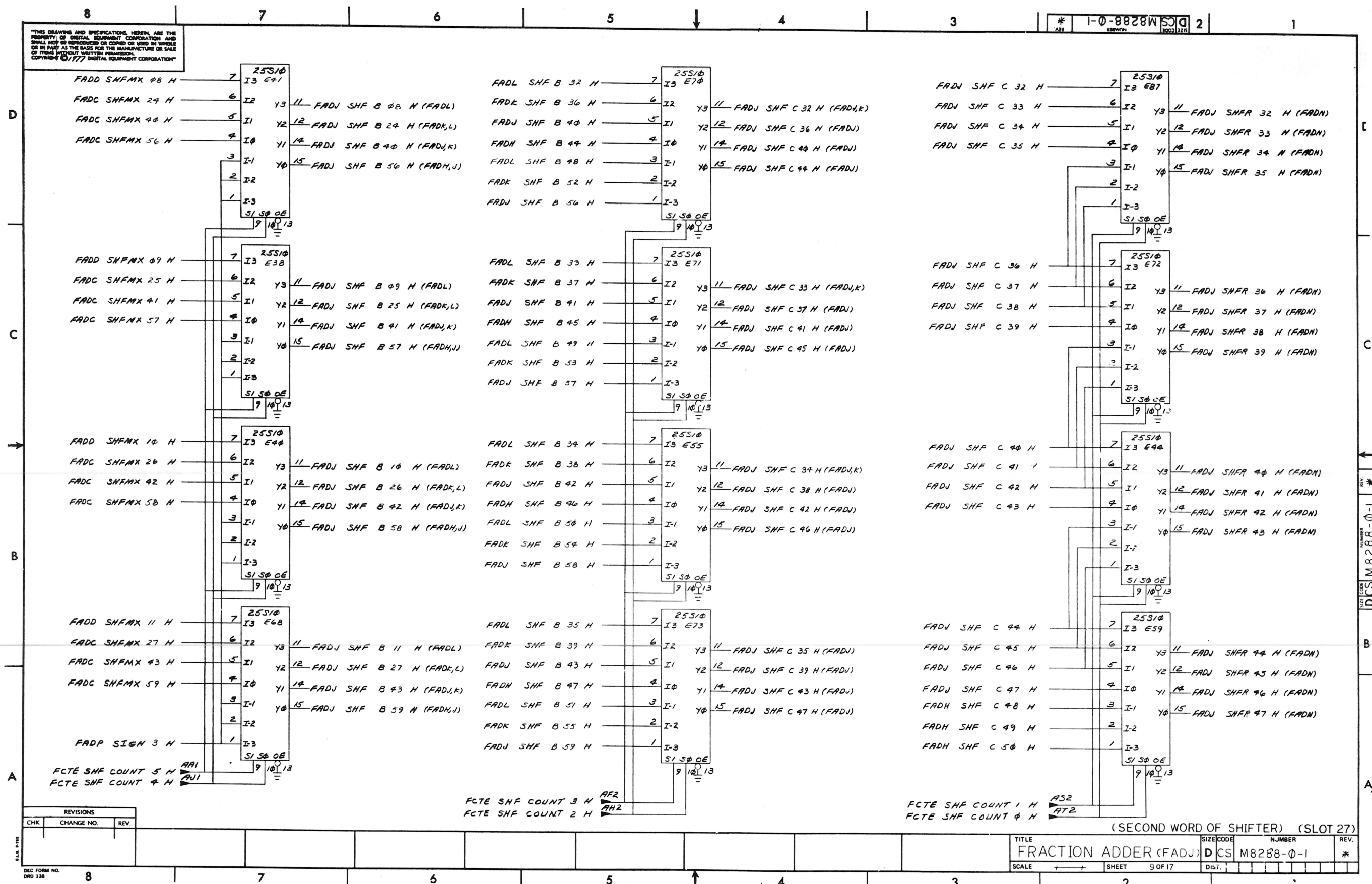
TITLE	SIZE CODE	NUMBER	REV.
FRACTION ADDER (FADE)	D CS	M8288-0-1	*
SCALE	SHEET	6 OF 17	DIST.

THIS DRAWING AND SPECIFICATIONS, HEREIN, ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION. COPYRIGHT © 1977 DIGITAL EQUIPMENT CORPORATION

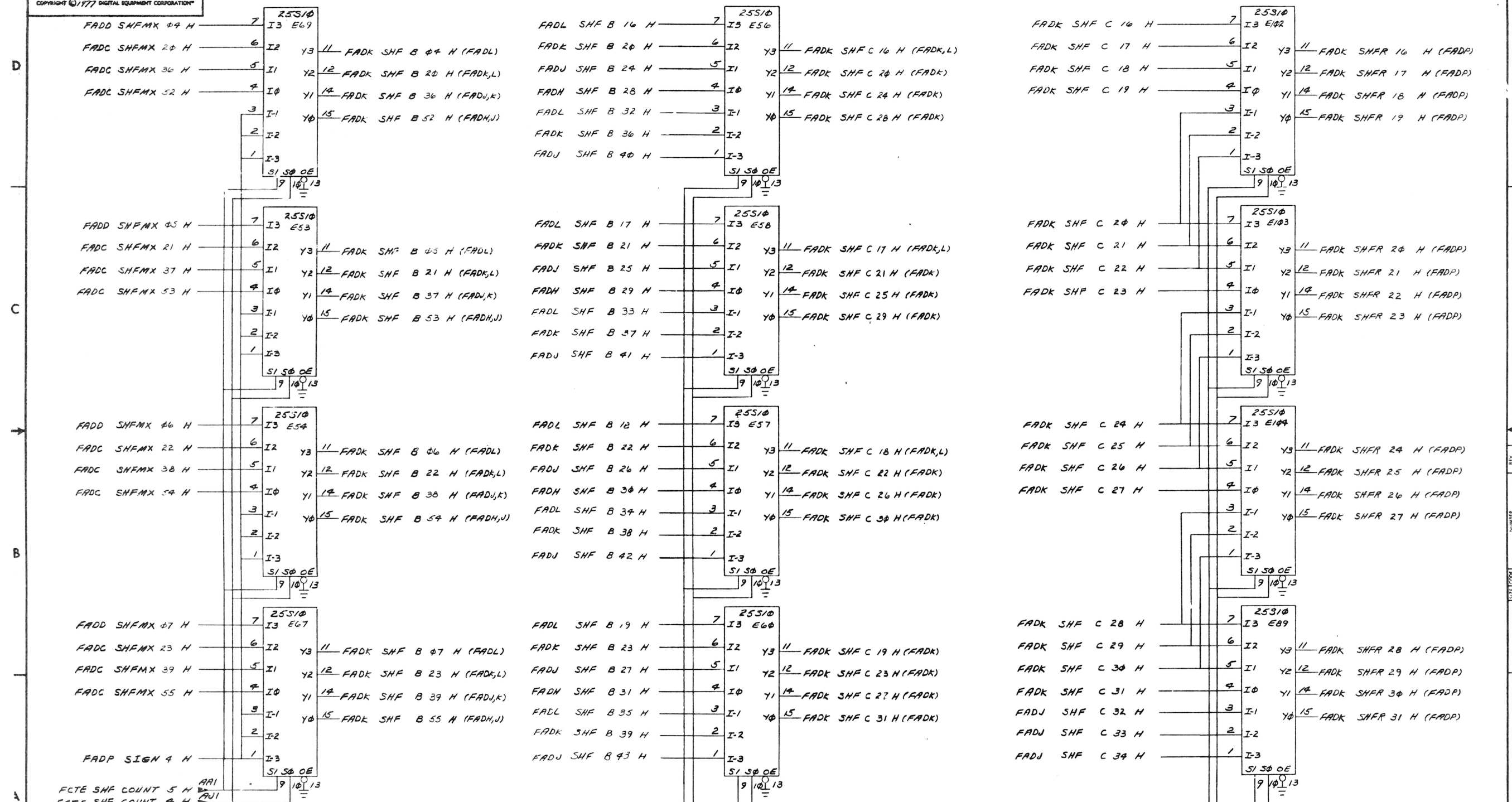


REVISIONS		
CHK	CHANGE NO.	REV.

TITLE		SIZE CODE	NUMBER	REV.
FRACTION ADDER (FADH)		DCS	M8288-0-1	*
SCALE	SHEET	DIST.		
	8 OF 17			

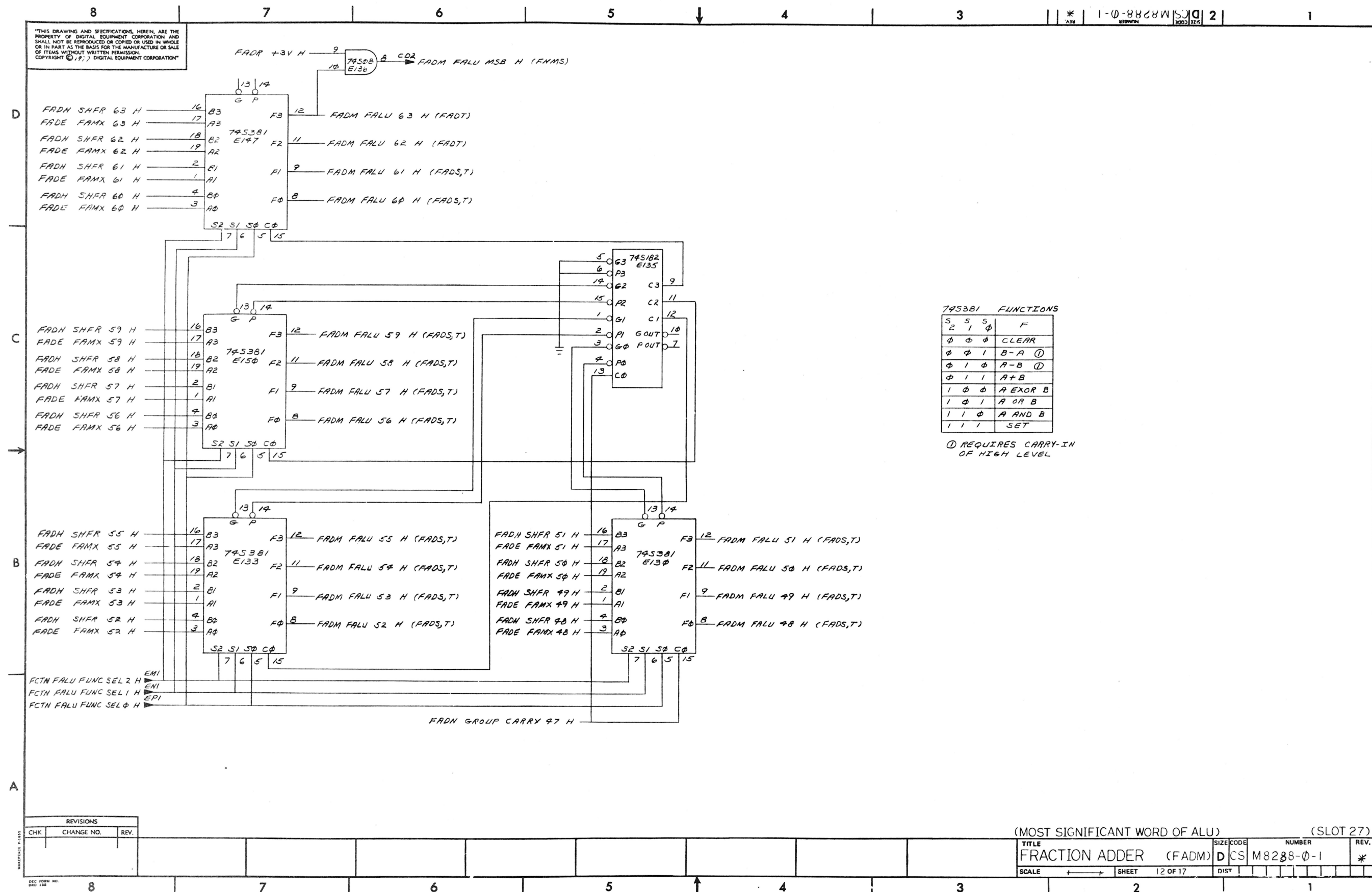


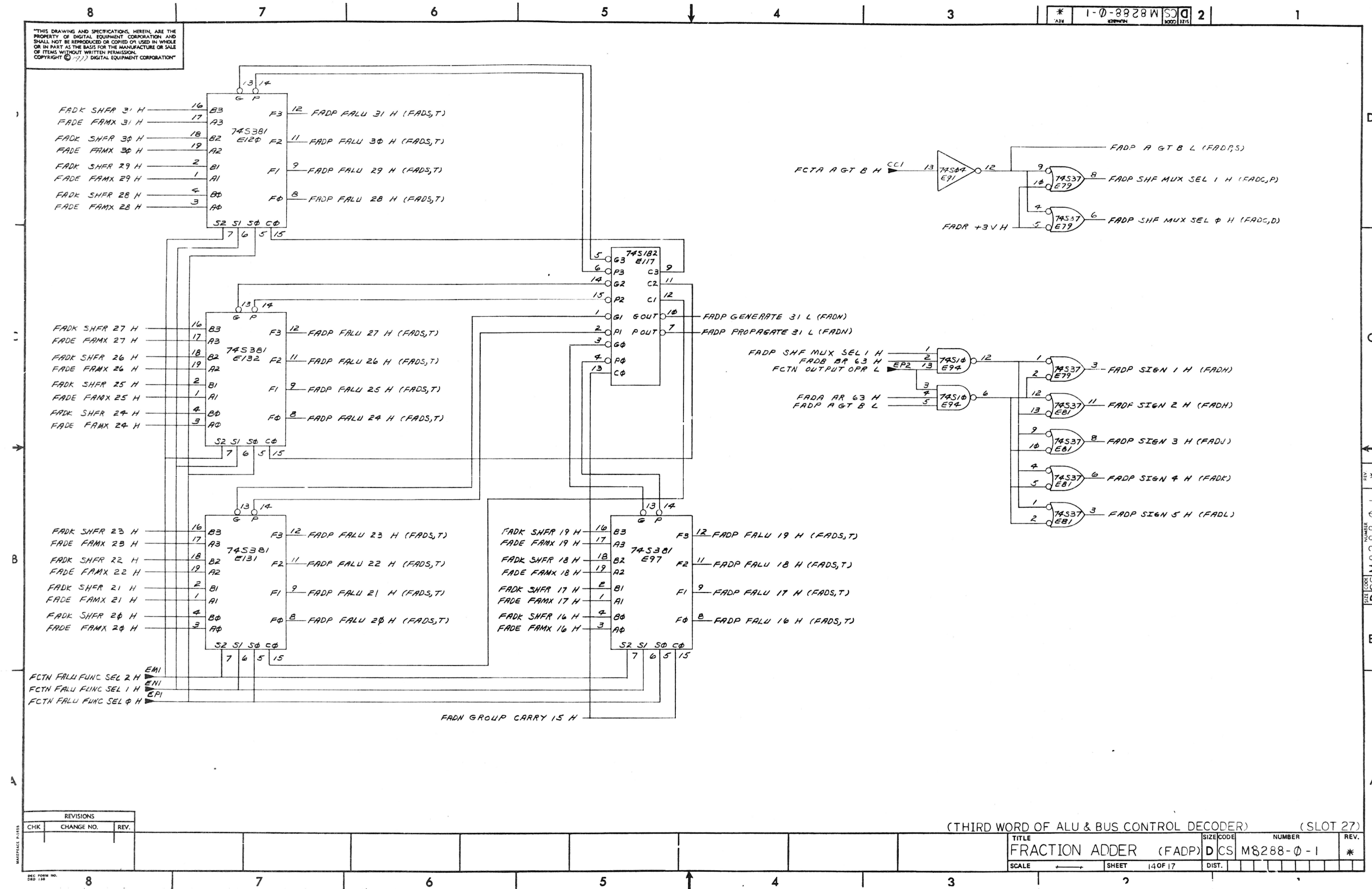
THIS DRAWING AND SPECIFICATIONS HEREIN ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION. COPYRIGHT © 1977 DIGITAL EQUIPMENT CORPORATION

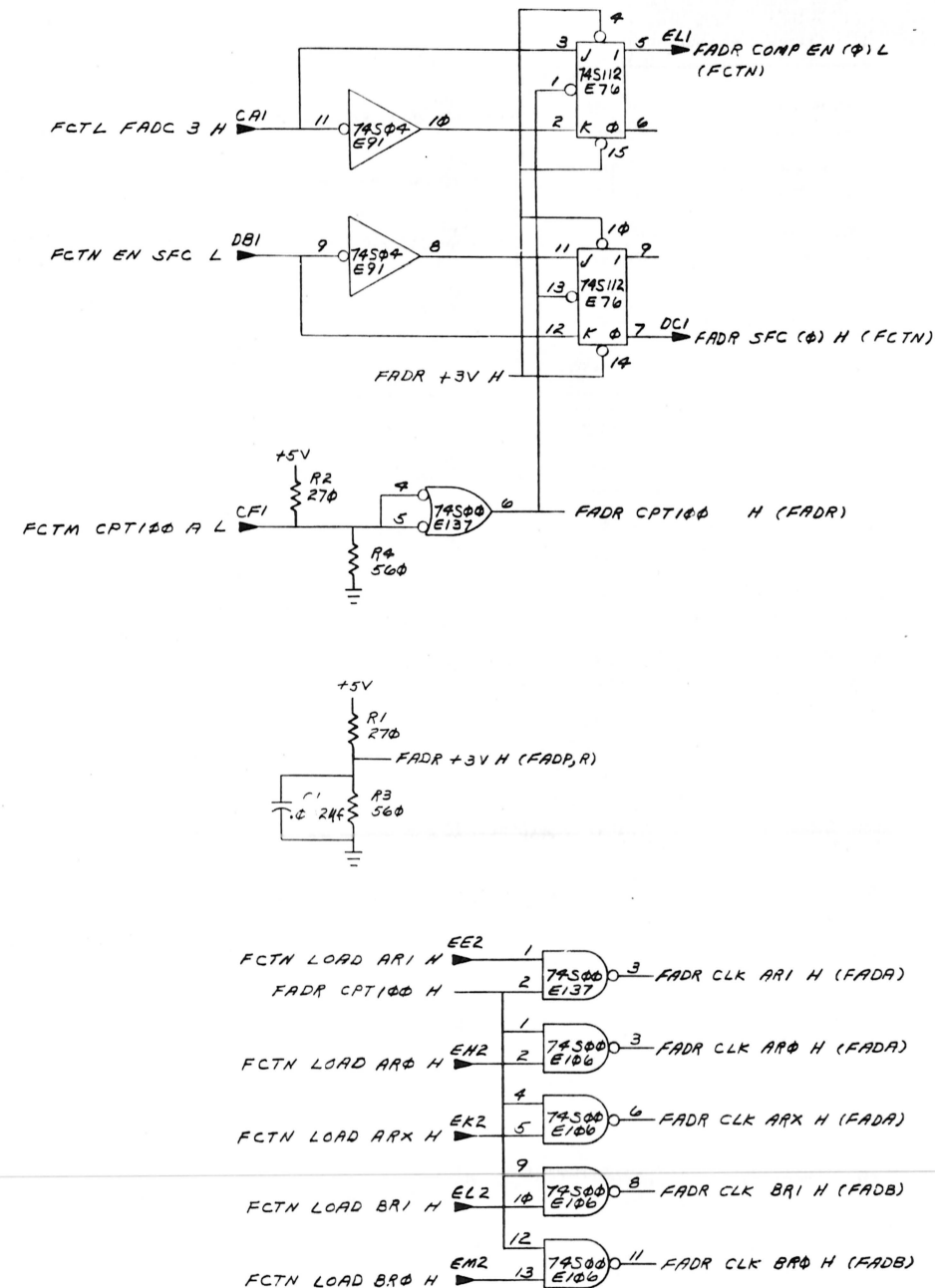


REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE CODE	NUMBER	REV.
FRACTION ADDER (FADK)	DCS	M8288-0-1	*
SCALE	SHEET	100F 17	DIST.

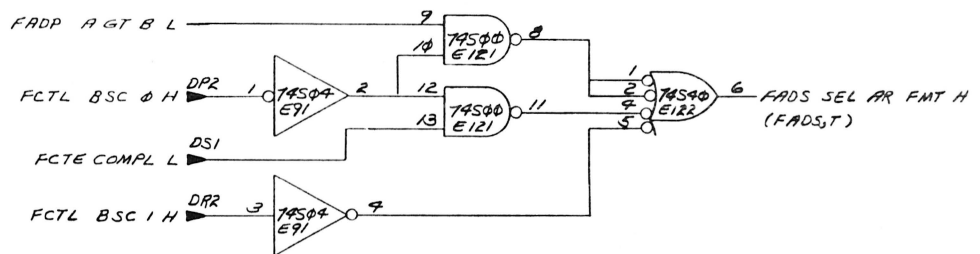
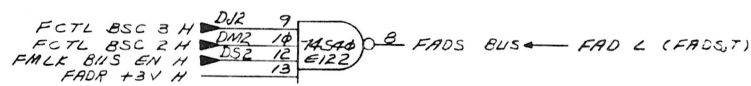
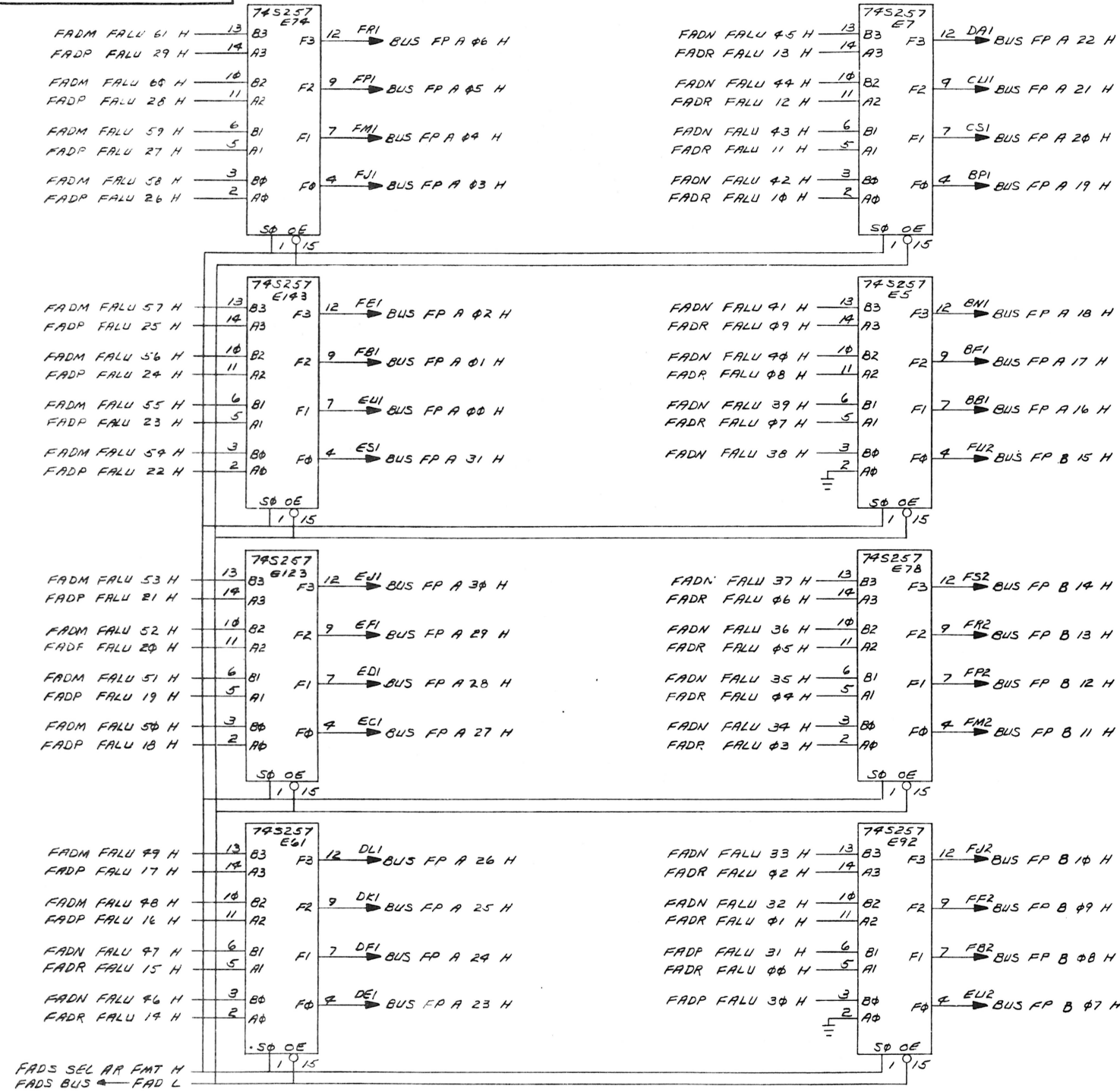






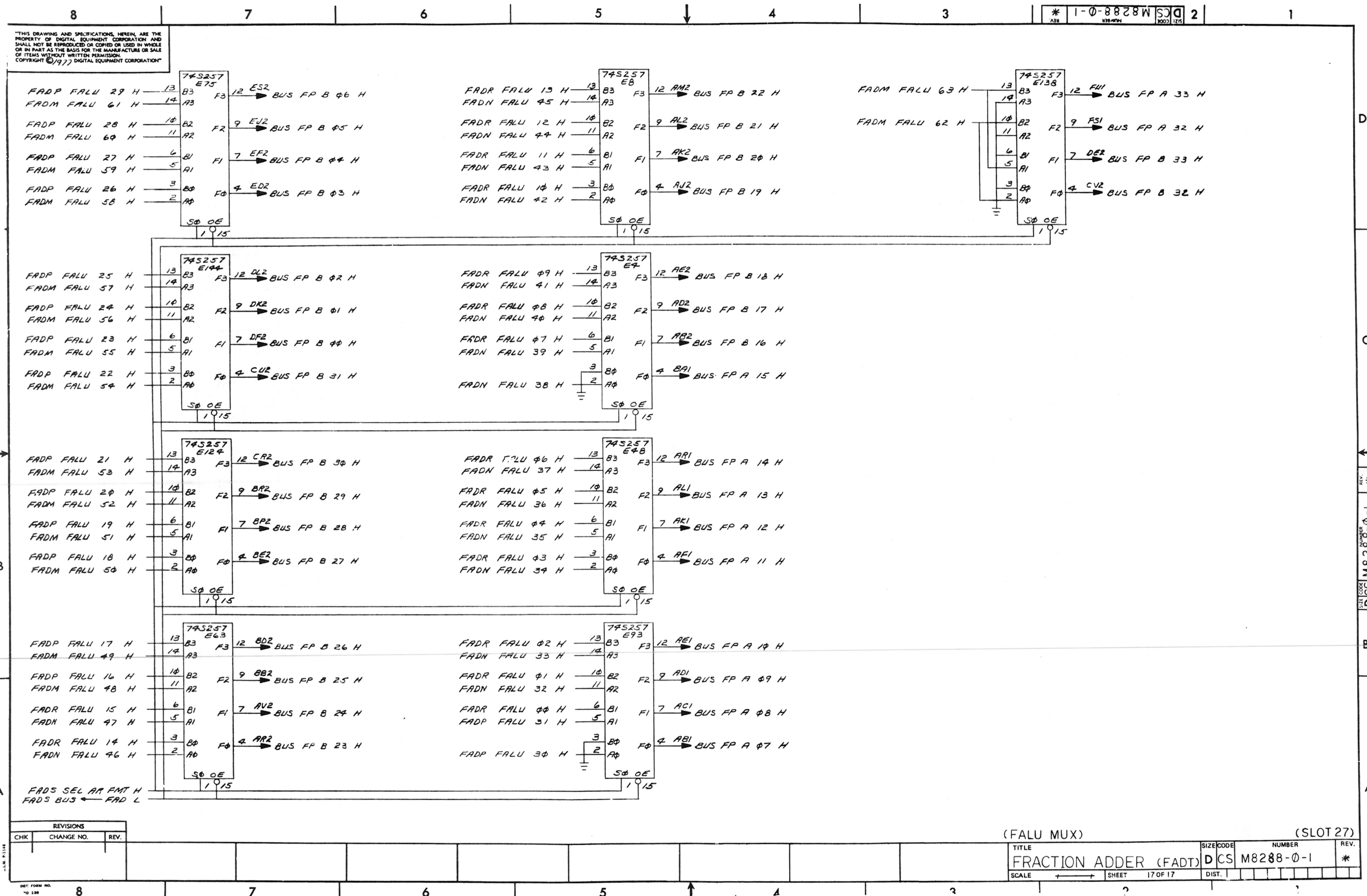
(LEAST SIGNIFICANT WORD OF ALU)				(SLOT 27)			
TITLE		SIZE CODE		NUMBER		REV.	
FRACTION ADDER (FADR)		D CS		M828-0-1		*	
SCALE	SHEET	15 OF 17	DISC.				

"THIS DRAWING AND SPECIFICATIONS, HEREIN, ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION. COPYRIGHT © 1977 DIGITAL EQUIPMENT CORPORATION"

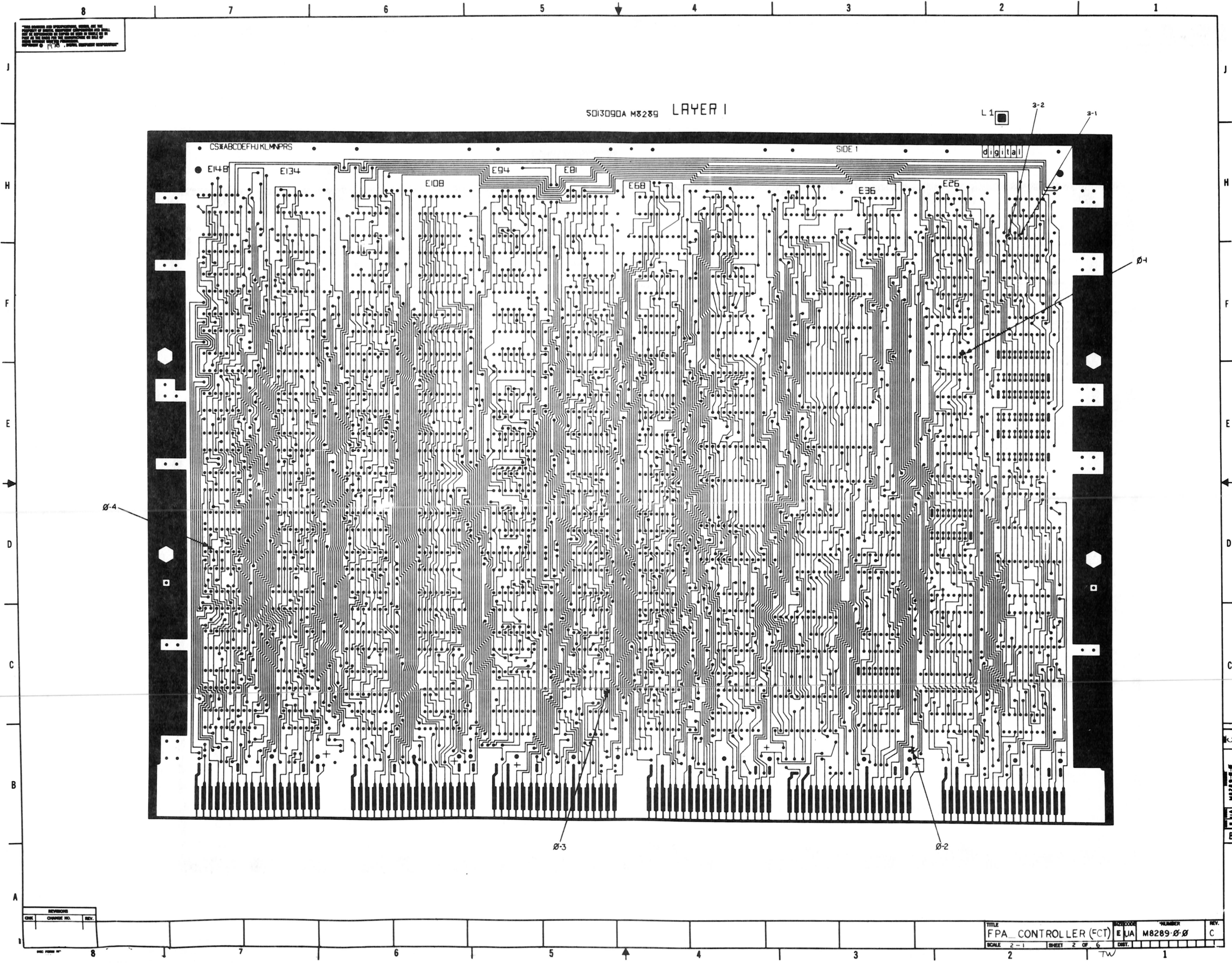


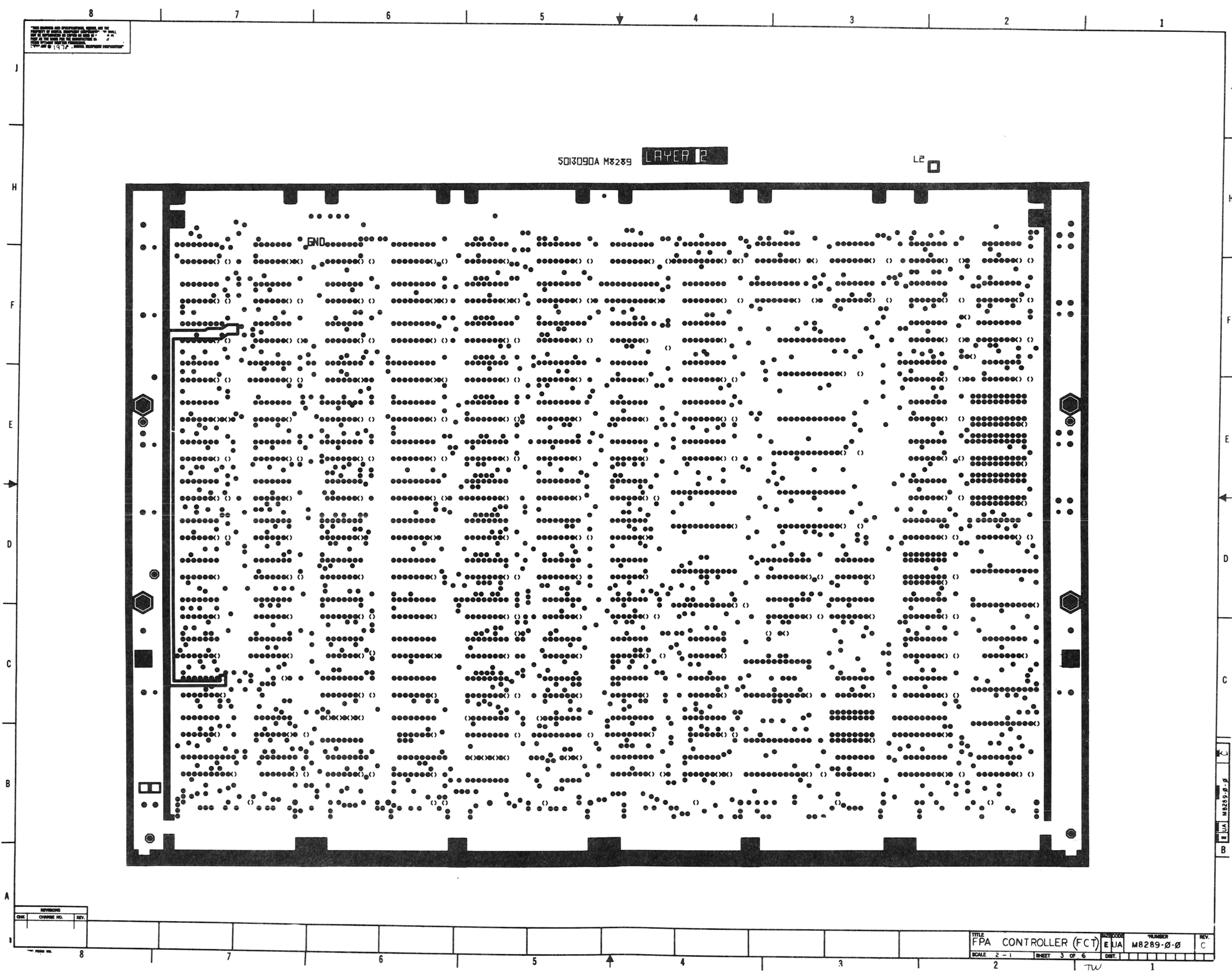
BSC	FUNCTION
C	IF A < B BUS A ← FALU H IF A > B BUS B ← FALU L
D	BUS A ← FALU L BUS B ← FALU H
E	BUS A ← FALU H BUS B ← FALU L

CHK	CHANGE NO.	REV.







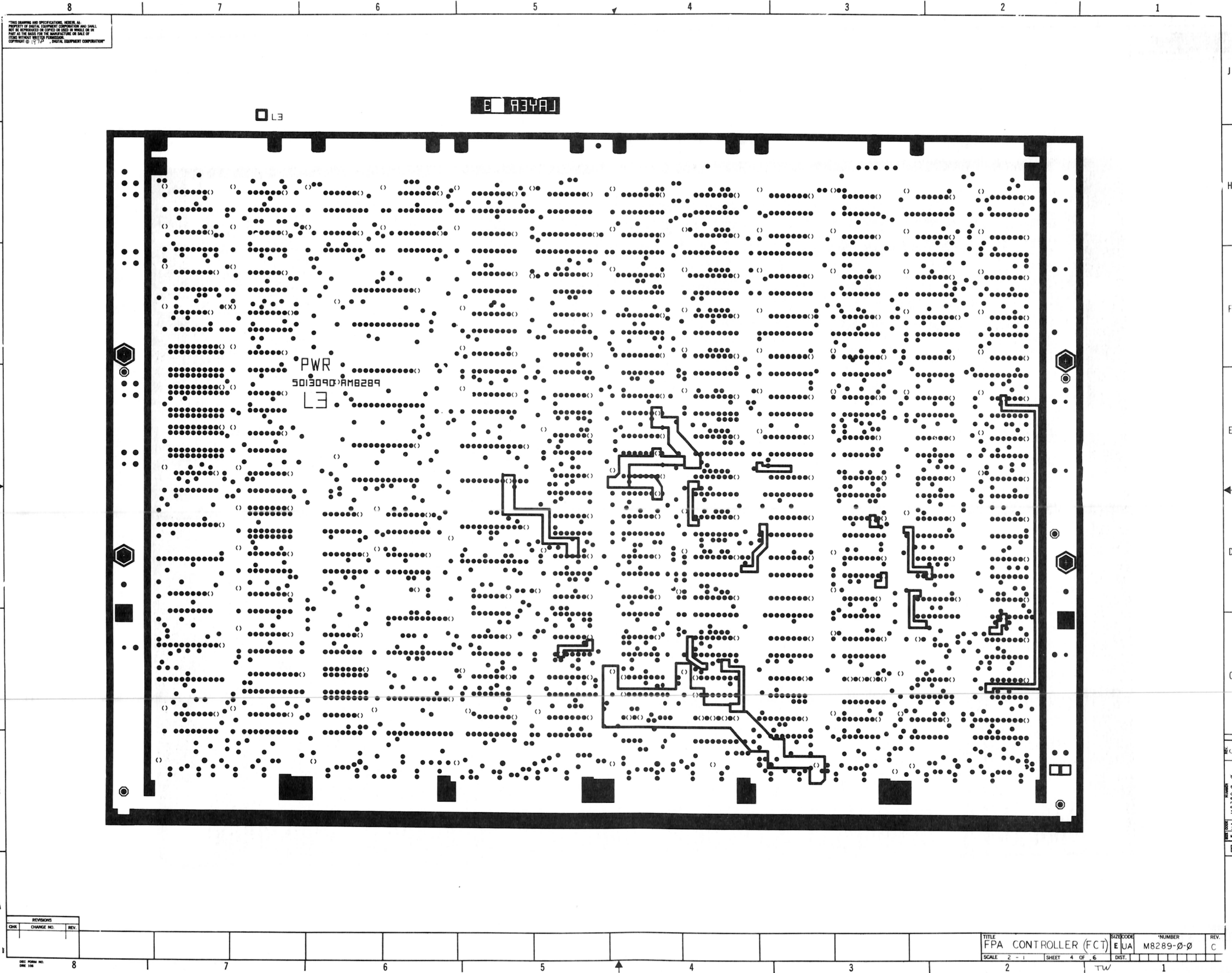


THIS DRAWING IS THE PROPERTY OF THE U.S. GOVERNMENT AND IS TO BE REPRODUCED IN WHOLE OR IN PART BY ANY METHOD WITHOUT PERMISSION OF THE U.S. GOVERNMENT PRINTING OFFICE.

REVISIONS		
QTY	CHANGE NO.	REV.

TITLE		FPA CONTROLLER (FCT)		REV.	C
SCALE	2 - 1	SHEET	3 OF 6	DATE	

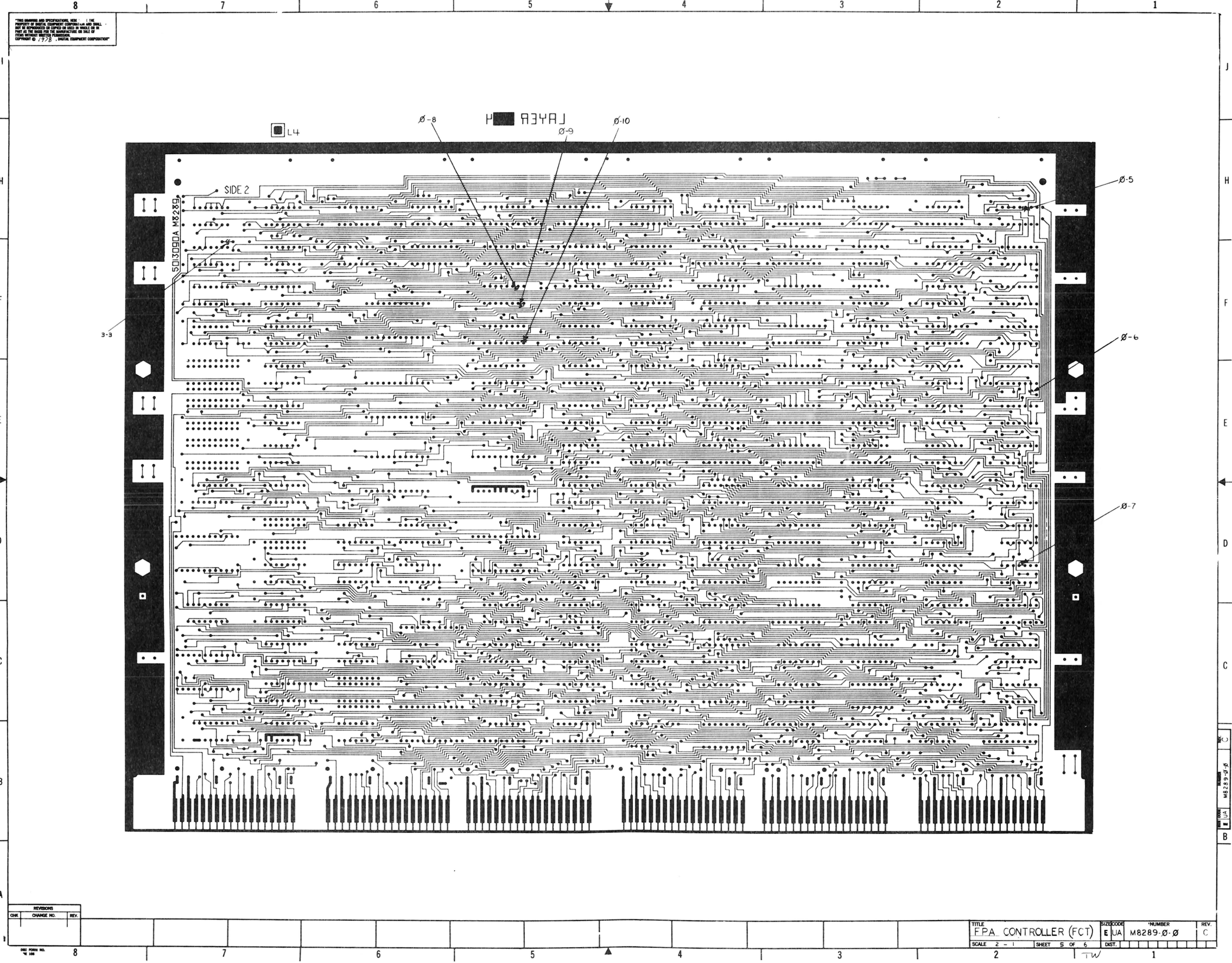
UJA M8289-B-0
B



THIS DRAWING AND SPECIFICATIONS, HEREIN, ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR COPIED IN WHOLE OR IN PART FOR THE BASIS FOR THE MANUFACTURE OR SALE OF OTHER WITHOUT WRITTEN PERMISSION. COPYRIGHT © 1977, DIGITAL EQUIPMENT CORPORATION.

REVISIONS		
CHK	CHANGE NO.	REV.
	1	C

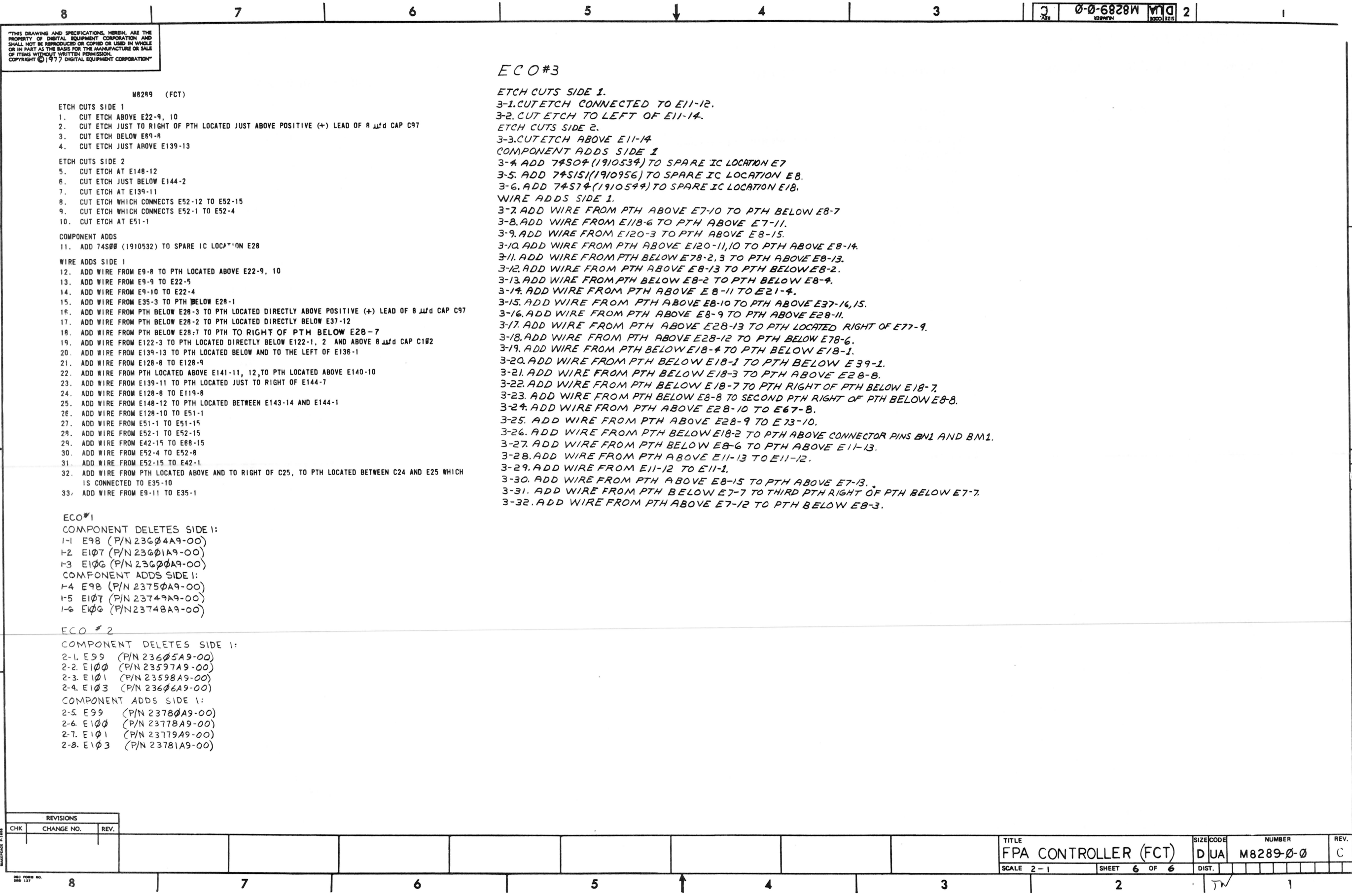
TITLE		FPA CONTROLLER (FCT)		PART NUMBER		M8289-0-0		REV.	
SCALE		2 - 1		SHEET		4 OF 6		DIST.	



THIS DRAWING AND SPECIFICATIONS, HEREIN, ARE THE PROPERTY OF THE UNITED STATES GOVERNMENT AND SHALL NOT BE REPRODUCED OR COPIED IN ANY MANNER OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT PERMISSION IN WRITING FROM THE UNITED STATES GOVERNMENT.

REVISIONS		
NO.	DESCRIPTION	REV.
1	INITIAL DESIGN	1
2	REVISION 1	2
3	REVISION 2	3
4	REVISION 3	4
5	REVISION 4	5
6	REVISION 5	6
7	REVISION 6	7
8	REVISION 7	8

TITLE		EPA CONTROLLER (FCT)		DRAWING NO.		M8289-0-0		REV.	
SCALE		2 - 1		SHEET		5 OF 6		C	
DATE		10/1/77		BY		JWA		C	



REVISIONS		
CHK	CHANGE NO.	REV.

DEC FORM NO. 137

TITLE		SIZE CODE	NUMBER	REV.
FPA CONTROLLER (FCT)		DUA	M8289-0-0	C
SCALE 2-1	SHEET 6 OF 6	DIST.		

LINE ITEM	DOCUMENT NUMBER	PART NUMBER	DESCRIPTION	QTY PER VARIATION	REFERENCE DESIGNATOR
				00	
1	1	D-MD-501309A-0-0	5013090-00	M8289	1
2	2		1012784-00	.047 MFD 50V -20+80 CER	91
3	3		1012084-01	8 MFD 25V G% 30D AL EL	7
4	4		1301775-00	820 1/4W 5%	5
5	5		1300295-00	330 1/4W 5%	5
6	6		1300247-00	120 1/4W 5%	6
7	7		1300250-00	150 1/4W 5%	6
8	8		1301890-00	560 1/4W 5%	3
9	9		1301972-00	270 1/4W 5%	3
10	10		1300365-00	1 K 1/4W 5%	1
11	11		1910552-00	74S194 SHIFT REG.,4BIT RIGH	19
12	12		1910531-00	DEC 74S181 ALU-4BIT	9
13	13		1910547-00	74S153 MUX 1 OF 4 (DUAL)	12
14	14		1910537-00	74S11 AND GATE-TRIPLE 3INP	3
15	15		1910542-00	74S64 A-O-I CATE 4-2-3-2	10
16	16		1913670-00	74S373 LATCH 8BIT TRASP TR	2
17	17		1911641-00	SN 74S257 MUX,QUAD 2 TO 1	2
18	18		1910534-00	74S04 INVERTER GATE-HEX 1I	9
19	19		1912389-00	74S08 AND GATE-QUAD 2IN,PO	5
20	20		1912746-00	DEC 74S37 NAND GATE-QUAD 2IN	5
21	21		1913839-00	74LS165 SHIFT REG.,8BIT	3
22	22		1910532-00	74S00 NAND GATE-QUAD 2IN\$	10
23	23		1912388-00	74S02 NOR GATE-QUAD 2IN,PO	5
24	24		1910549-00	74S158 MUX 1 OF 2 (QUAD)	5

! REVISION HISTORY	! BASIC PART NO: M8289	! DRN: F SMART	! DATE: 01-NOV-77	! D ! I ! G ! I ! T ! A ! L !
! ENG! ECO NUMBER	! REV	! SECTION A OF A	! TITLE PARTS LIST	
! ---! INIT	! *	! SECTION, VARIATION INDEX	! CHK'D: F SMART	! DATE: 01-NOV-77
! WH !00001	! A	! [A] 00		! FPA CONTROLLER
! P.G!00002	! B	! [B]		
! J.F!00003	! C	! [C]	! DES.ENG: STAN LACKEY	! DATE: 02-NOV-77
! !	! !	! [D]		
! !	! !	! [E]		! DOCUMENT NUMBER
! !	! !	! [F]	! RESP.ENG.: STAN LACKEY	! DATE: 02-NOV-77
! !	! !	! [H]		! SIZE!CCDE! NUMBER ! REV !
! !	! !	! [J]		! ! ! ! !
! !	! !	! [K]	! MFG.ENG.: MIKE TERELLA	! DATE: 02-NOV-77 ! K ! PL ! M8289-0-DBP ! C !
! !	! !	! [L]		
! !	! !	! [M]	! ASSEMBLY NUMBER:	! TOP DOCUMENT NUMBER:
! !	! !	! [N]	! D-UA-M8289-0-0	! M8289 ! FILE NAME: ! EDIT #!
				! M8289C.PLS ! 20 !

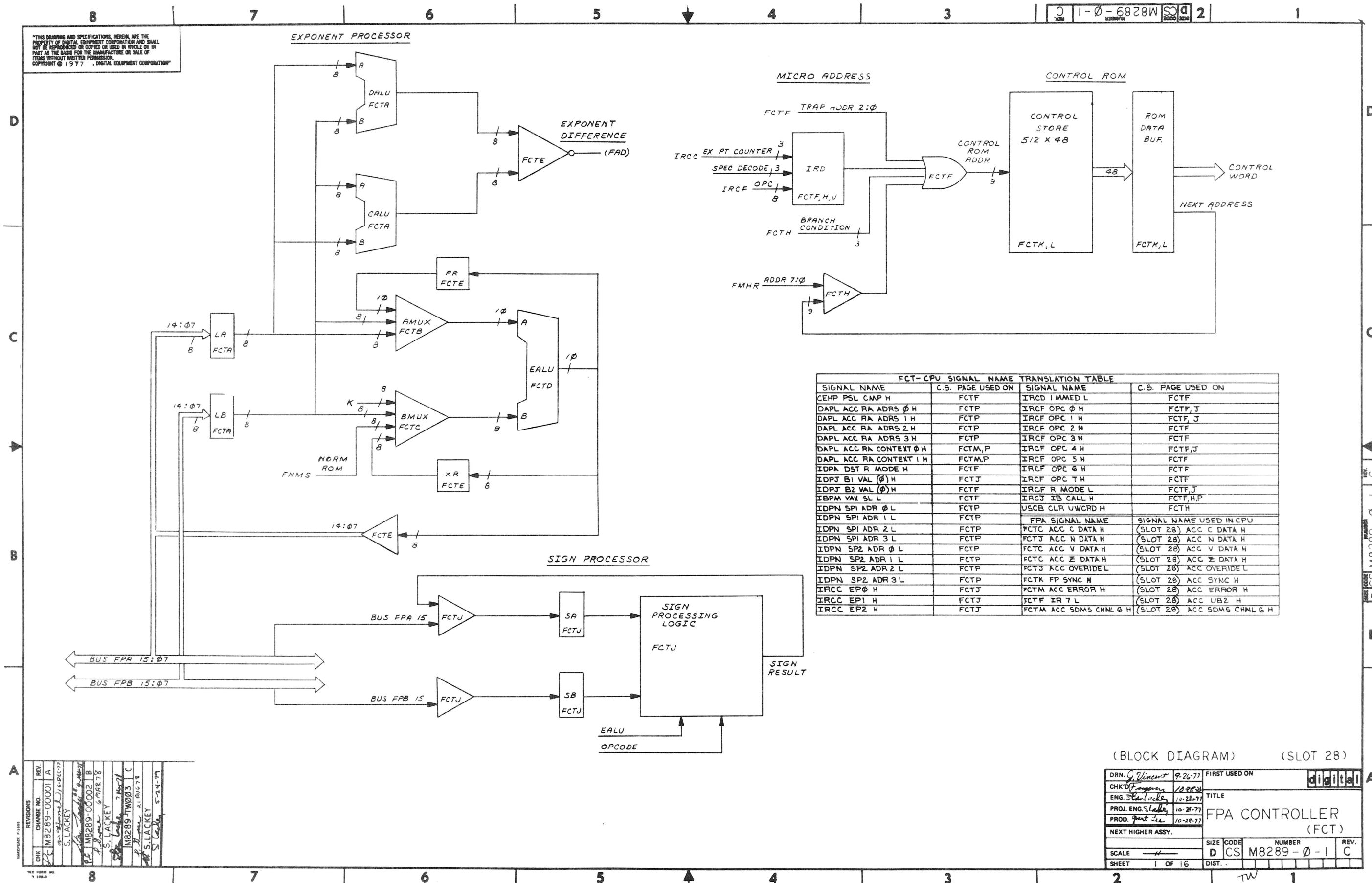
"THIS DRAWING AND SPECIFICATIONS HEREIN, ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION.
COPYRIGHT (C) 1979. DIGITAL EQUIPMENT CORPORATION "

SHEET A2 OF A2

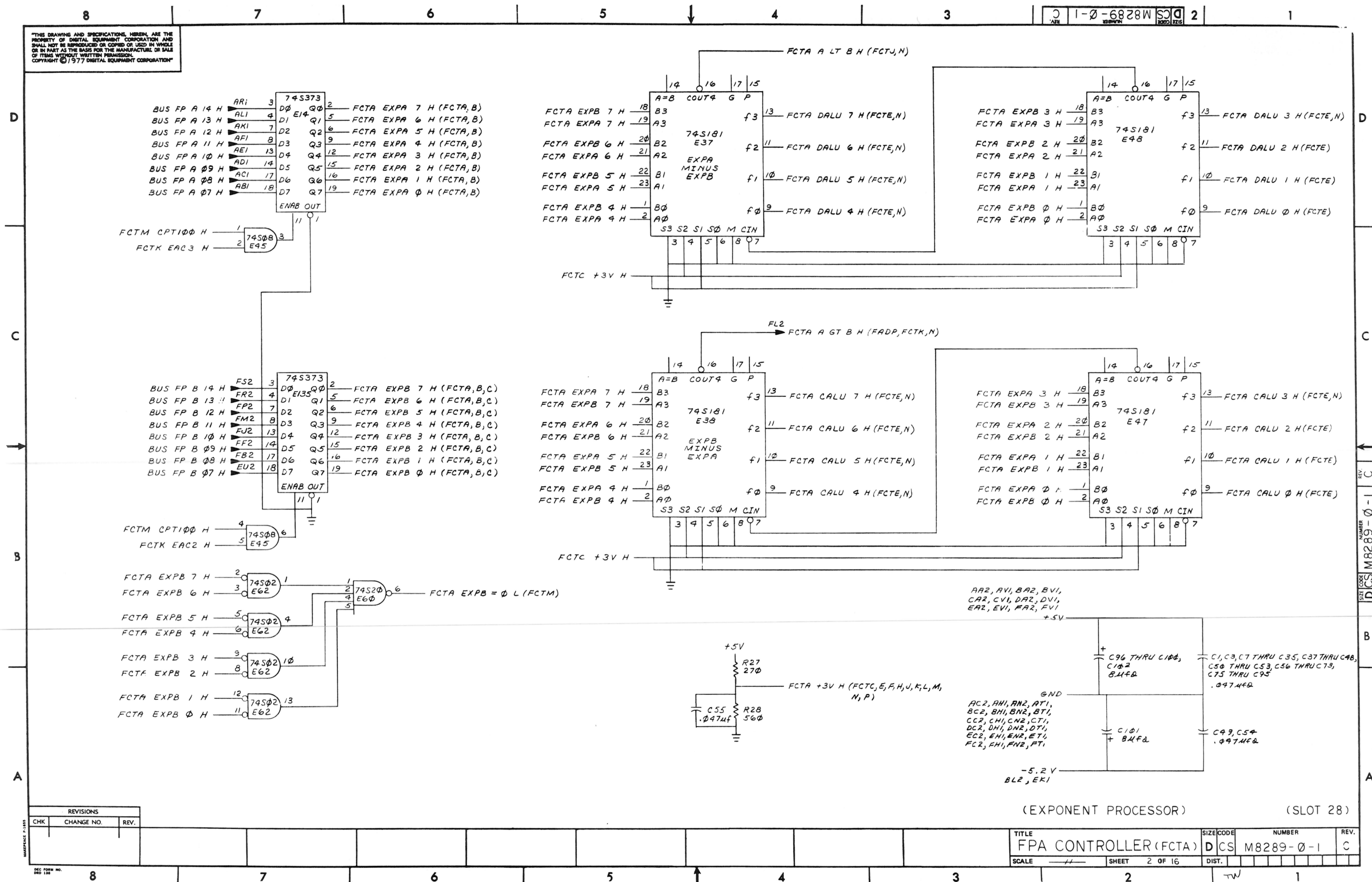
0 NOTE: IC SPARE LOCATIONS ARE E6

! ! ! ! ! ! !	! TITLE	!	! SIZE ! CODE !	DOCUMENT NUMBER	! REV
! D ! I ! G ! I ! T ! A ! L !	FPA CONTROLLER	!	!	!	!
!	!	!	SECTION A OF A	!	!
!	!	!	!	K PL M8289-0-DBP	C

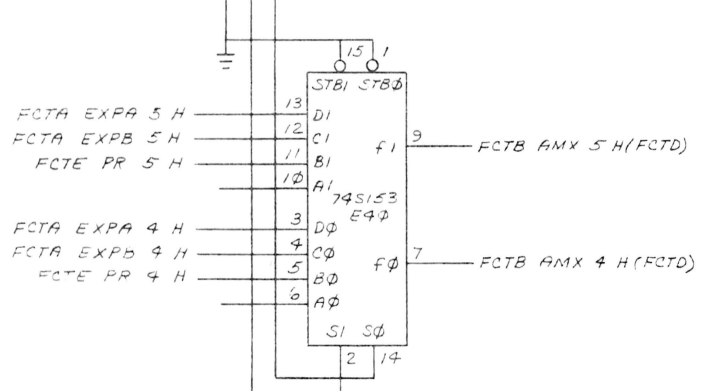
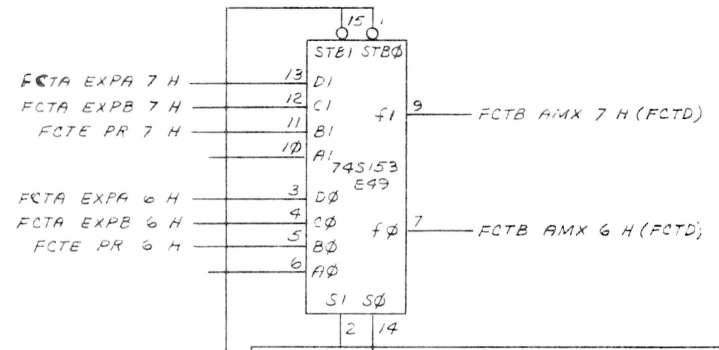
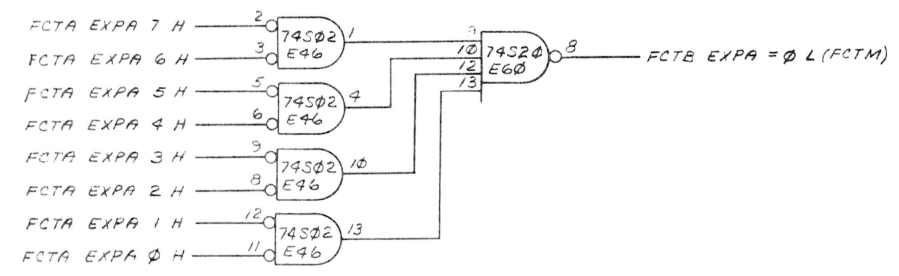
"THIS DRAWING AND SPECIFICATIONS, HEREIN, ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION.
COPYRIGHT © 1977, DIGITAL EQUIPMENT CORPORATION



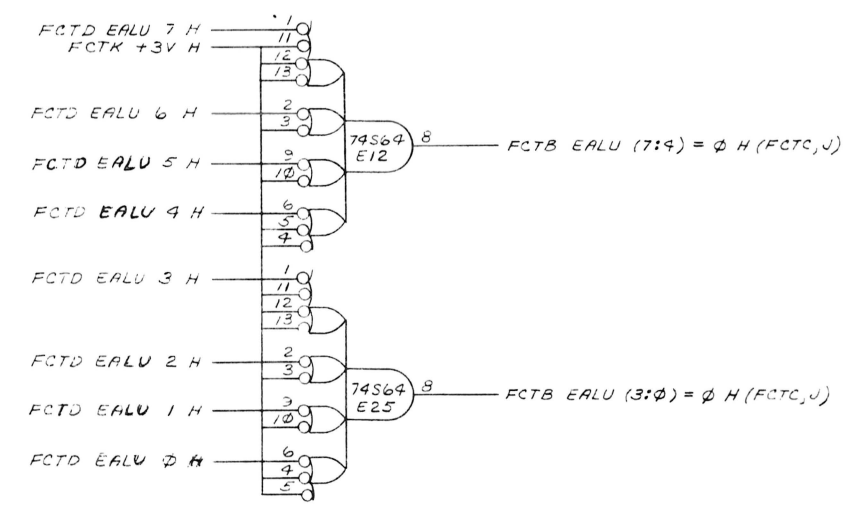
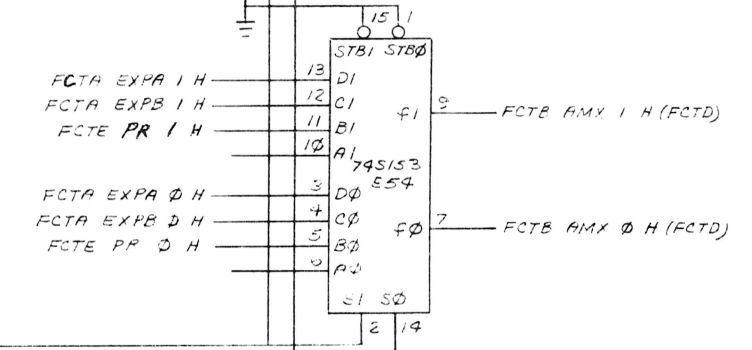
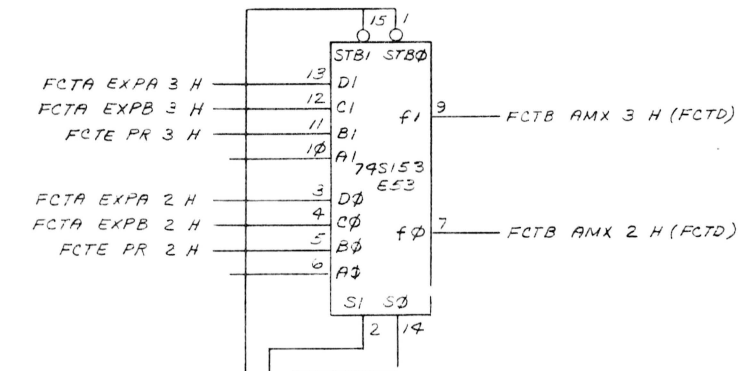
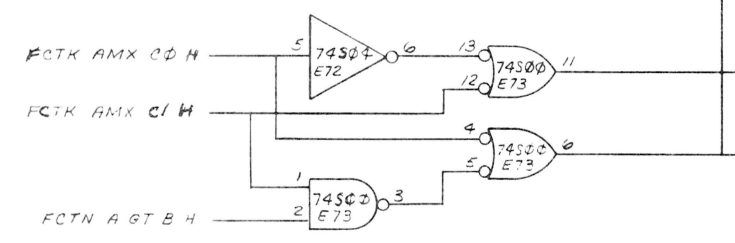
(BLOCK DIAGRAM) (SLOT 28)



"THIS DRAWING AND SPECIFICATIONS, HEREIN, ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION.
COPYRIGHT © 1977 DIGITAL EQUIPMENT CORPORATION"



AMX C		
1	0	EXPA
0	0	EXPB
1	0	PR
1	1	ADD/SUB

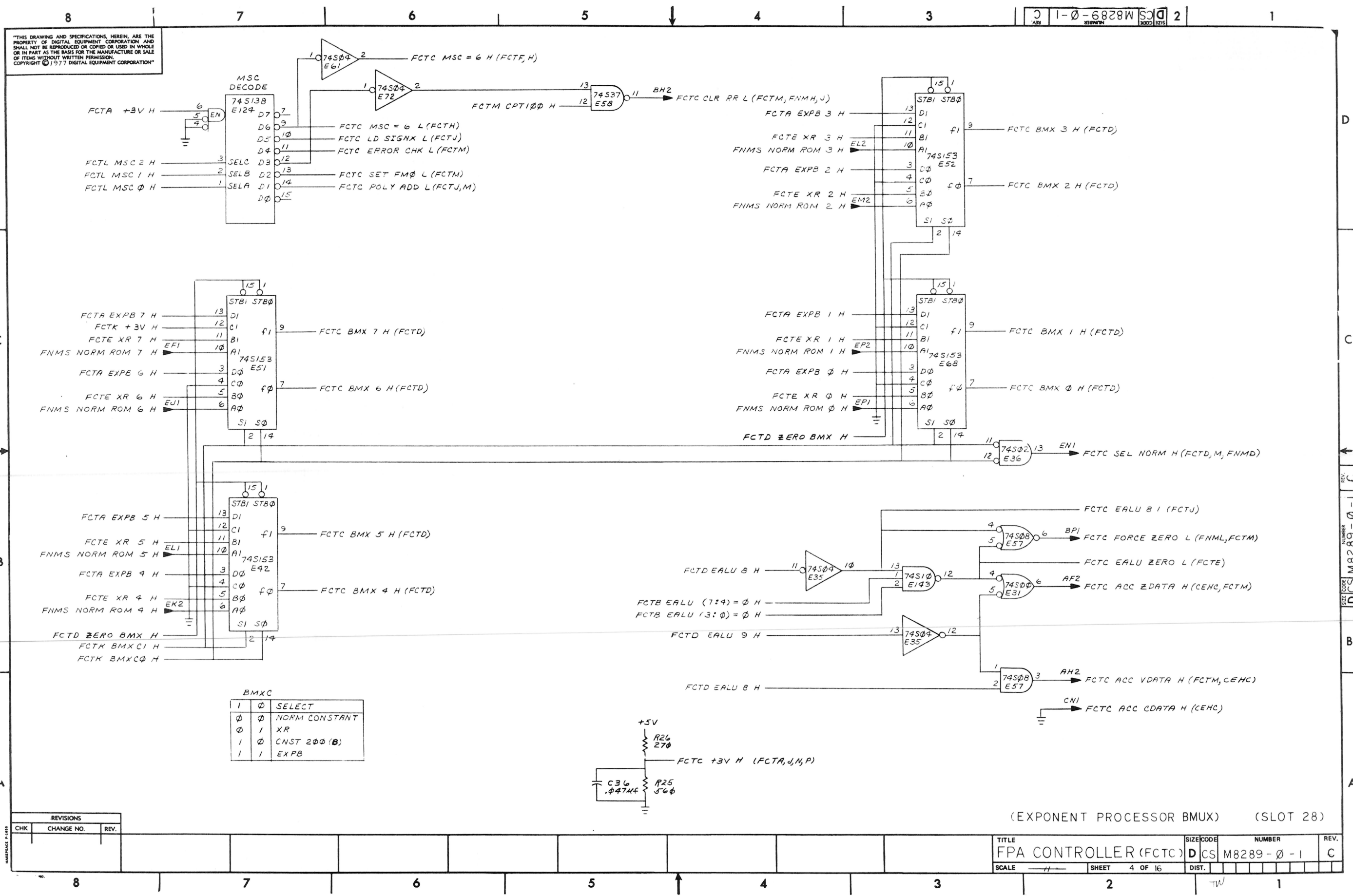


(EXPONENT PROCESSOR AMUX) (SLOT 28)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE	SIZE CODE	NUMBER	REV.
FPA CONTROLLER (FCTB)	D CS	M8289-0-1	C
SCALE	SHEET	3 OF 16	
	DIST.		

REV. 1
NUMBER
M8289-0-1
SIZE CODE
D CS



"THIS DRAWING AND SPECIFICATIONS, HEREIN, ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION. COPYRIGHT © 1977 DIGITAL EQUIPMENT CORPORATION"

BMUX		
1	0	SELECT
0	0	NORM CONSTANT
0	1	XR
1	0	CNST 200 (B)
1	1	EXPB

REVISIONS		
CHK	CHANGE NO.	REV.

(EXPONENT PROCESSOR BMUX) (SLOT 28)

TITLE	SIZE CODE	NUMBER	REV.
FPA CONTROLLER (FCTC)	D	M8289-0-1	C
SCALE	SHEET	4 OF 16	
		DIST.	

"THIS DRAWING AND SPECIFICATIONS, HEREIN, ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION. COPYRIGHT © 1977 DIGITAL EQUIPMENT CORPORATION"

8

7

6

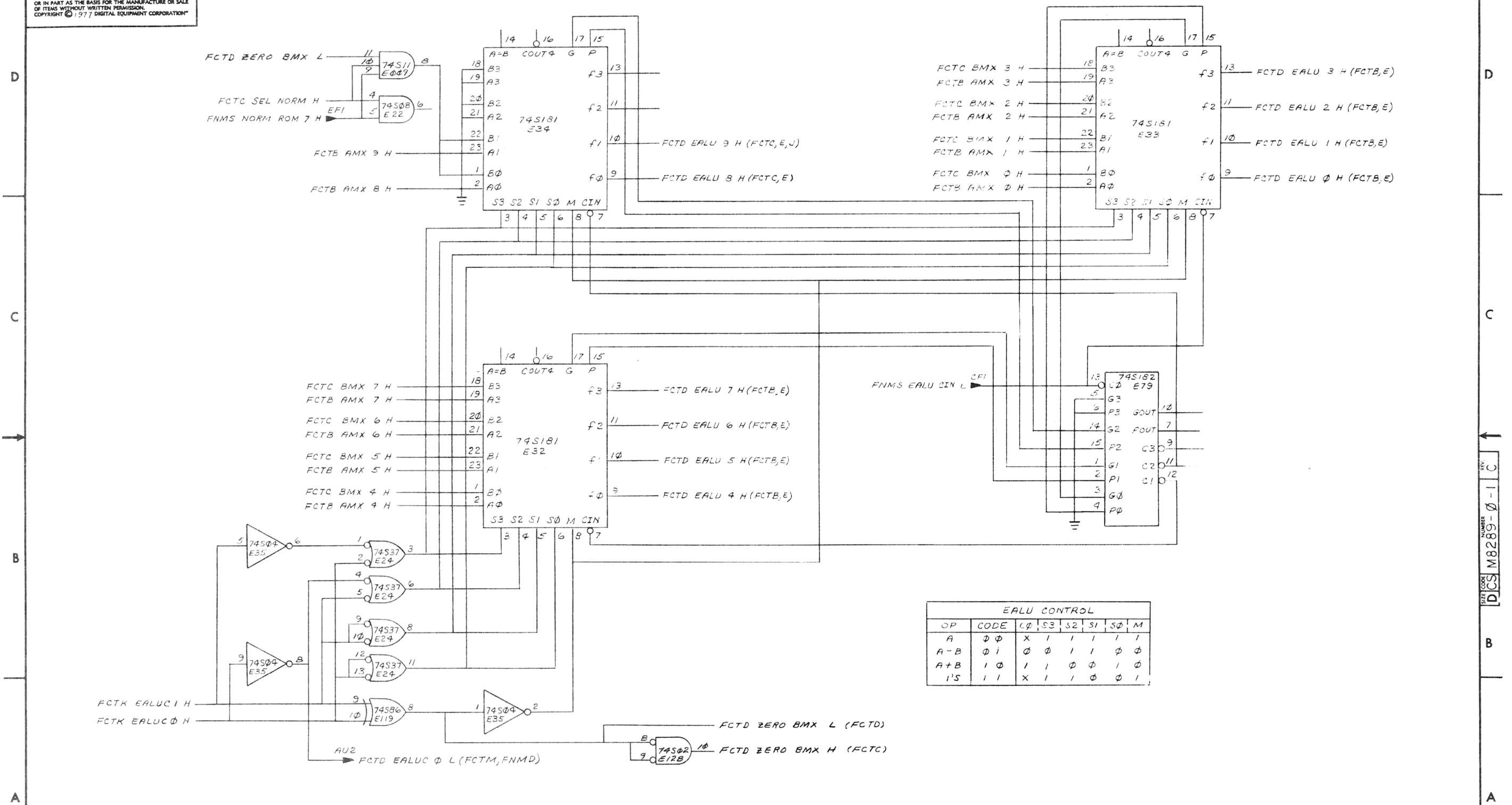
5

4

3

2

1



EALU CONTROL								
OP	CODE	C ϕ	S3	S2	S1	S ϕ	M	
A	$\phi \phi$	X	1	1	1	1	1	
A-B	$\phi 1$	ϕ	ϕ	1	1	ϕ	ϕ	
A+B	1 ϕ	1	1	ϕ	ϕ	1	ϕ	
1'S	1 1	X	1	1	ϕ	ϕ	1	

REVISIONS		
CHK	CHANGE NO.	REV.

(EXPONENT ALU)		(SLOT 28)	
TITLE FPA CONTROLLER (FCTD)		SIZE CODE D CS	NUMBER M8289-0-1
SCALE 1/1	SHEET 5 OF 16	DIST.	REV. C

8

7

6

5

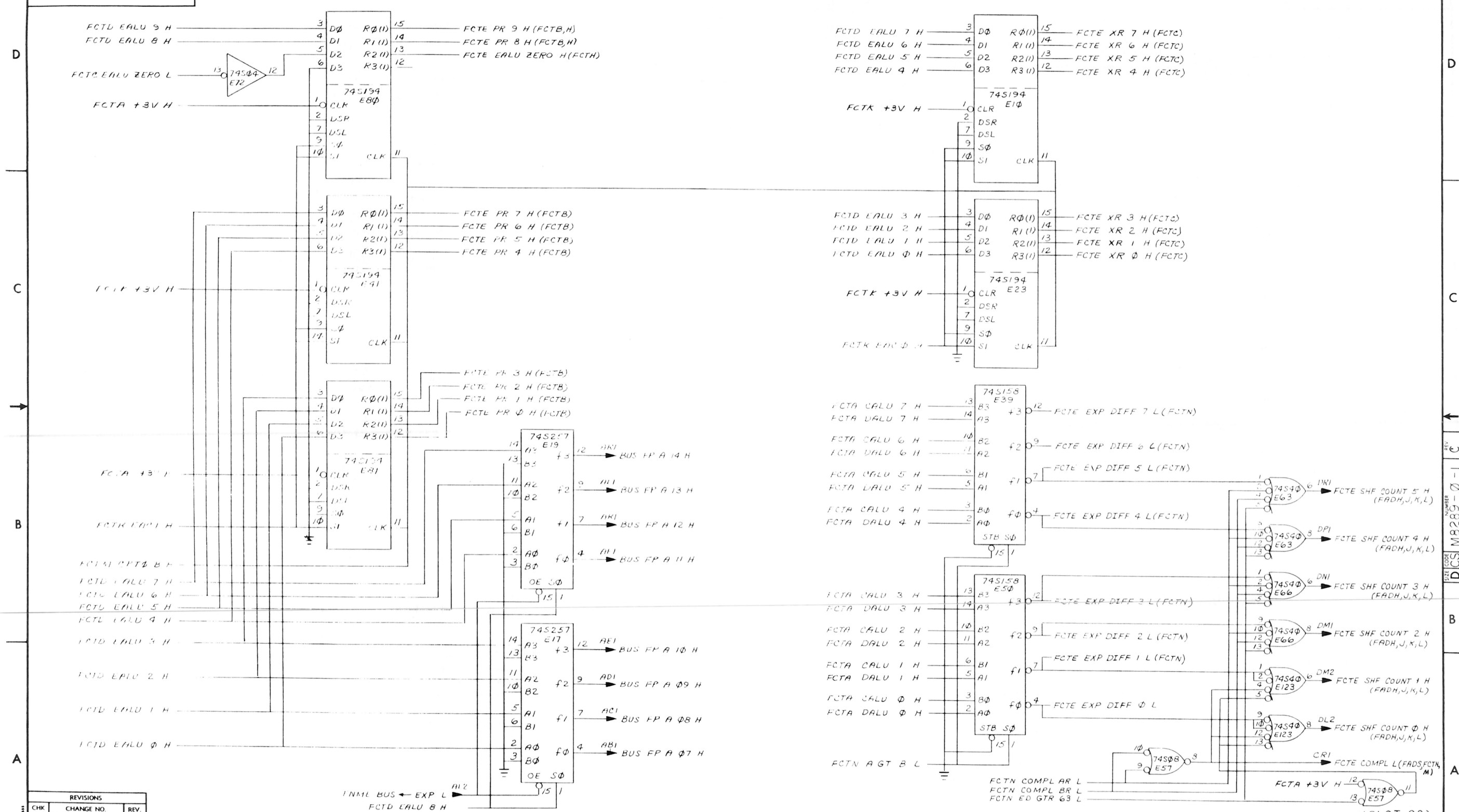
4

3

2

1

"THIS DRAWING AND SPECIFICATIONS, HEREIN, ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION.
COPYRIGHT © 1977 DIGITAL EQUIPMENT CORPORATION"

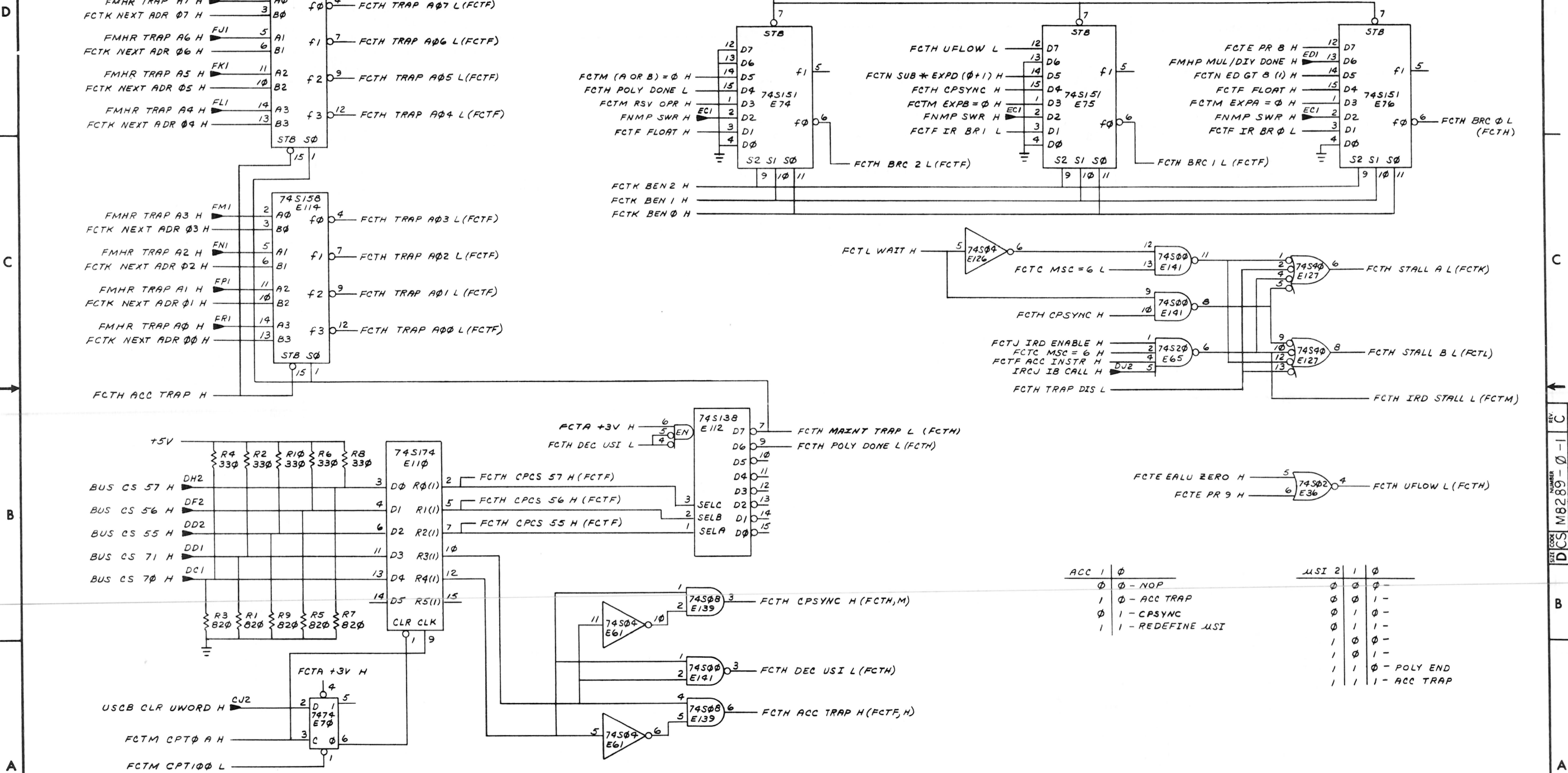


REVISIONS		
CHK	CHANGE NO.	REV.

(SLOT 28)

TITLE FPA CONTROLLER (FCTE)				SIZE D	CODE CS	NUMBER M8289-Ø-1				REV C
SCALE 1/4"		SHEET 6 OF 16		DIST.						

THIS DRAWING AND SPECIFICATIONS, HEREIN, ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION.
COPYRIGHT © 1977 DIGITAL EQUIPMENT CORPORATION

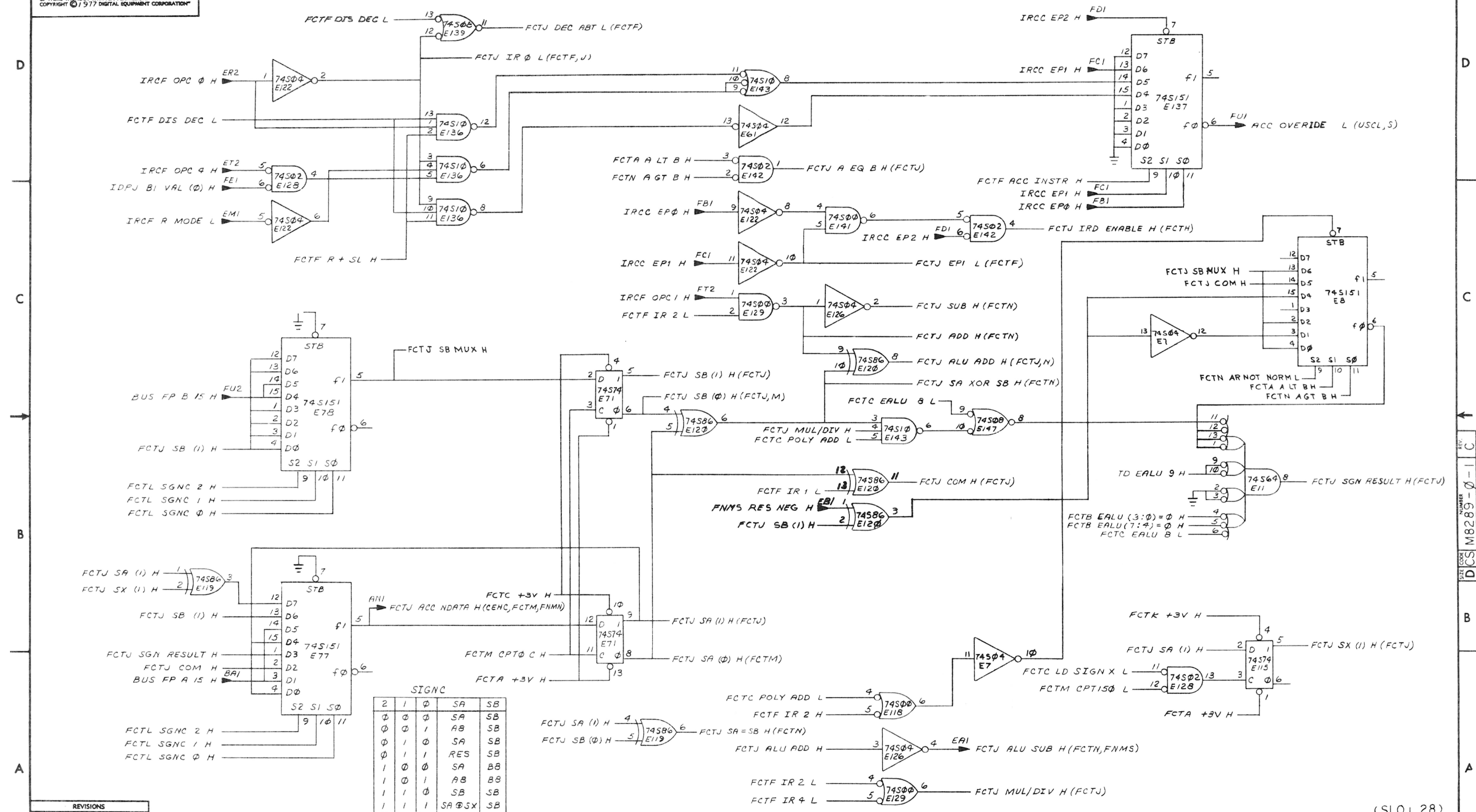


REVISIONS		
CHK	CHANGE NO.	REV.

TITLE		SIZE CODE	NUMBER	REV.
FPA CONTROLLER (FCTH)		D CS	M8289-0-1	C
SCALE	SHEET	DIST.		
1/8"	8 OF 16			

(SLOT 28)

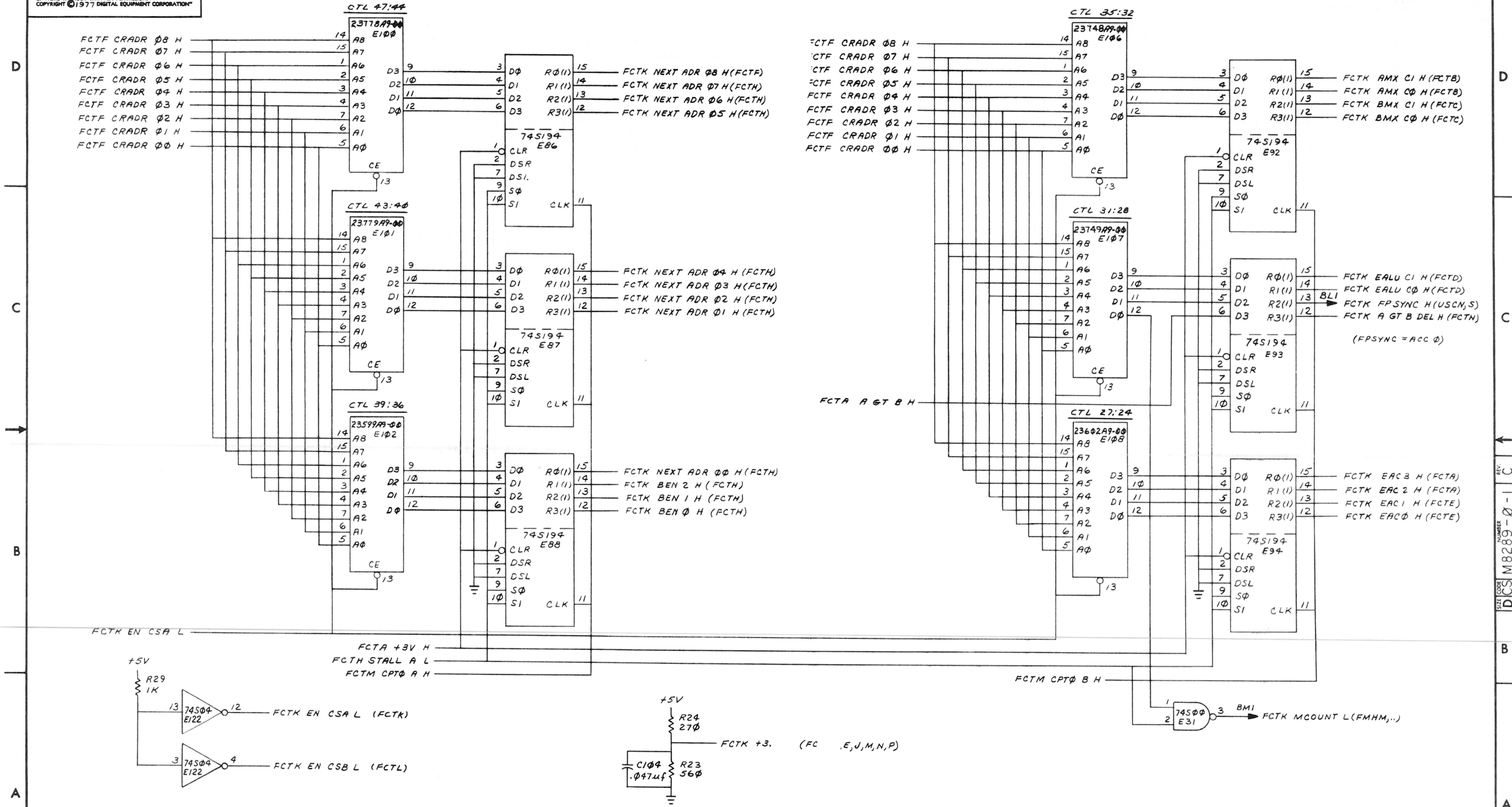
"THIS DRAWING AND SPECIFICATIONS, HEREIN, ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION.
COPYRIGHT © 1977 DIGITAL EQUIPMENT CORPORATION"



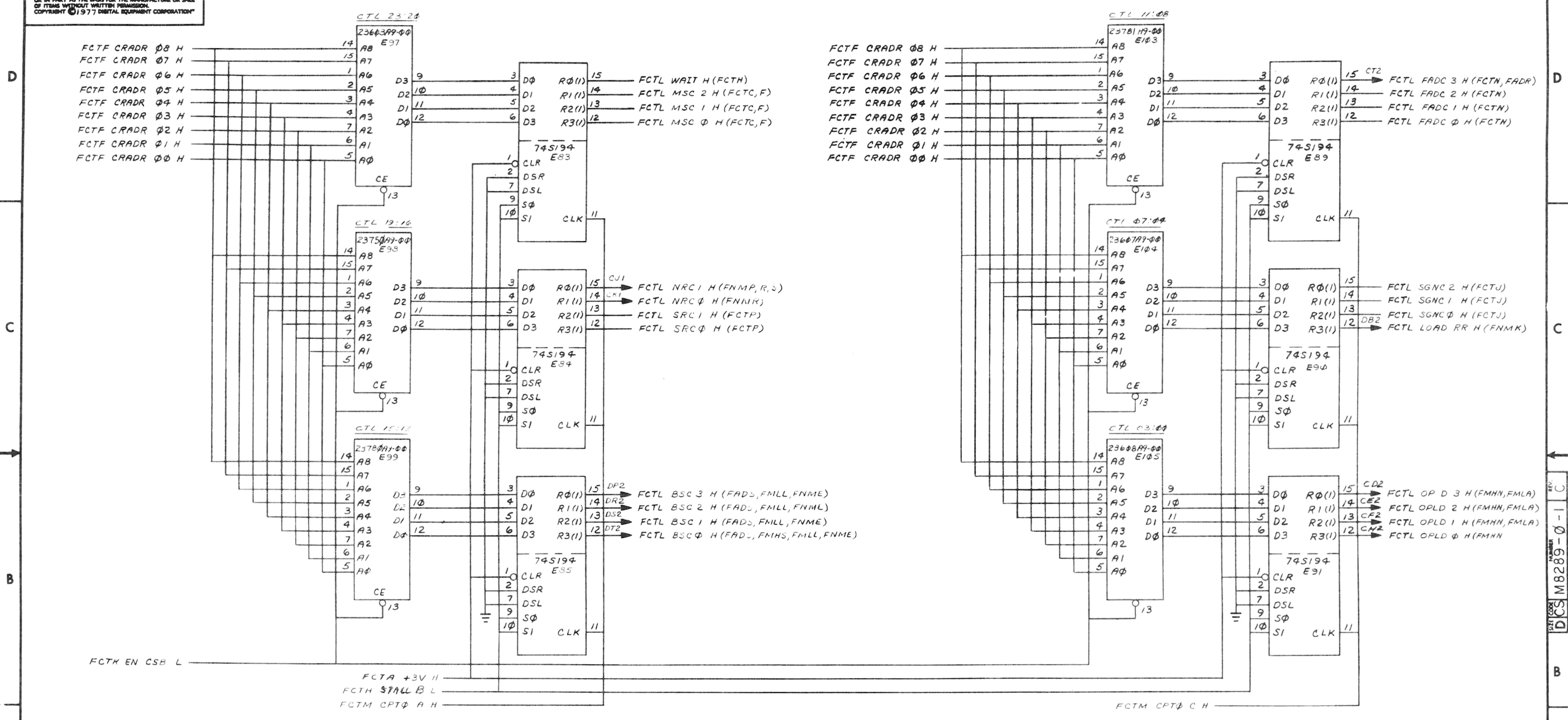
SIGNC			SA	SB
2	1	0	SA	SB
0	0	0	SA	SB
0	0	1	AB	SB
0	1	0	SA	SB
0	1	1	RES	SB
1	0	0	SA	BB
1	0	1	AB	BB
1	1	0	SB	SB
1	1	1	SA ⊕ SX	SB

REVISIONS		
CHK	CHANGE NO.	REV.

THIS DRAWING AND SPECIFICATIONS, HEREIN, ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION. COPYRIGHT © 1977 DIGITAL EQUIPMENT CORPORATION



"THIS DRAWING AND SPECIFICATIONS, HEREIN, ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION. COPYRIGHT © 1977 DIGITAL EQUIPMENT CORPORATION"



REVISIONS		
CHK	CHANGE NO.	REV.

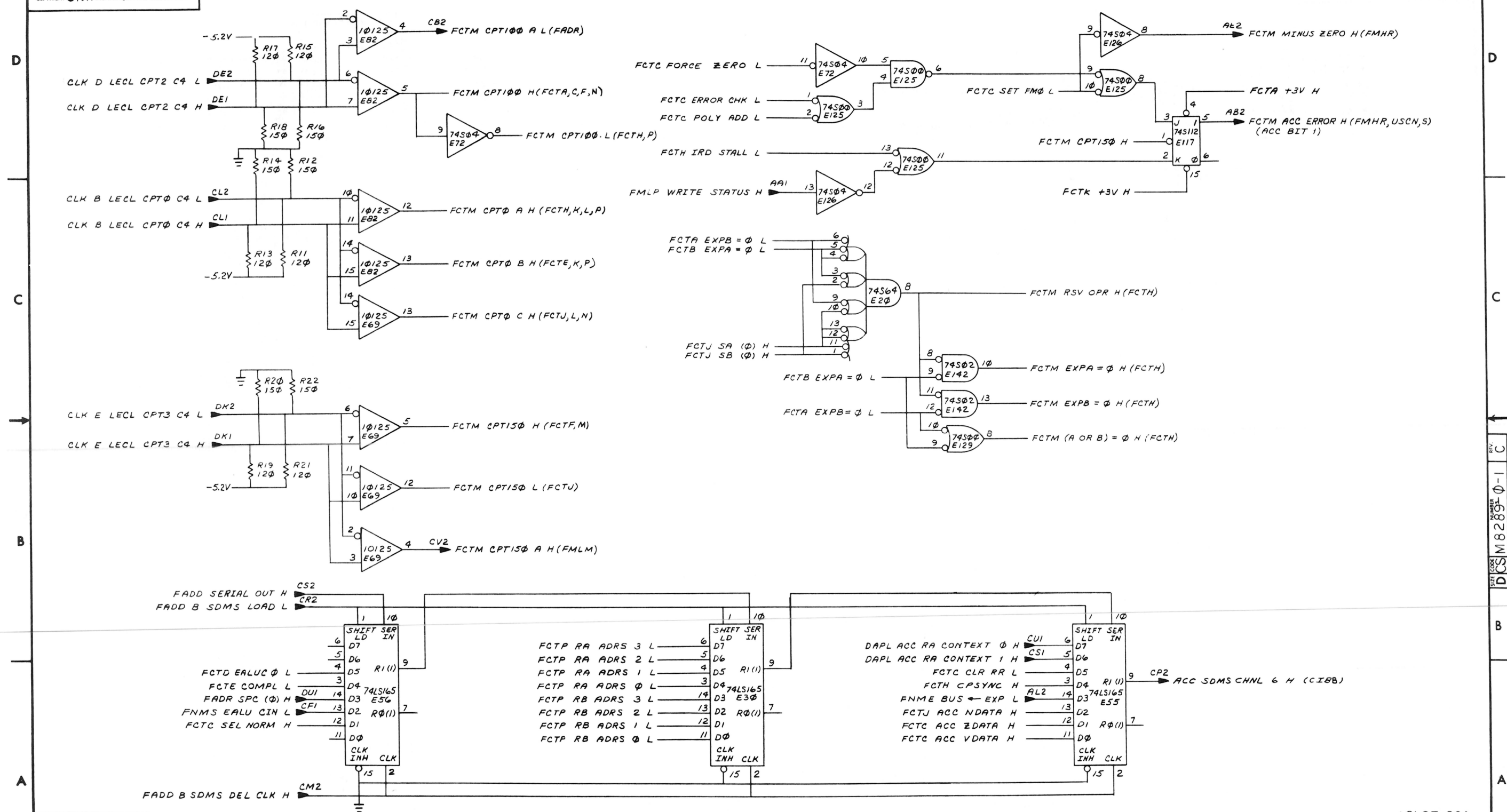
(CONTROL STORE AND DATA LATCHES) (SLOT 28)

TITLE		SIZE CODE	NUMBER		REV.
FPA CONTROLLER (FCTL)		D	CS	M8289-0-1	C
SCALE	H	SHEET	11	OF 16	

THIS DRAWING AND SPECIFICATIONS, HEREIN, ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION. COPYRIGHT © 1977 DIGITAL EQUIPMENT CORPORATION

1-0-6828W

2

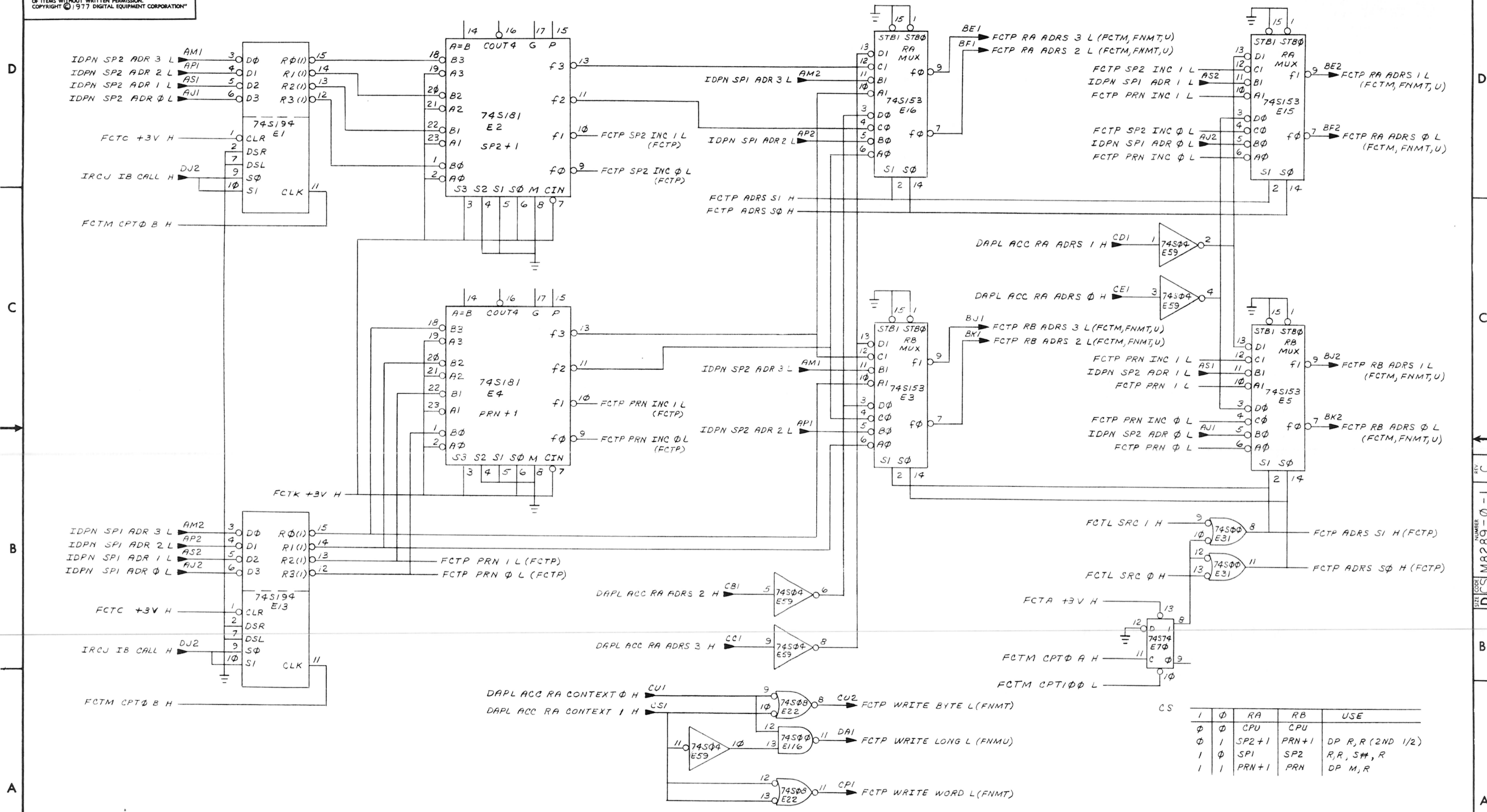


REVISIONS		
CHK	CHANGE NO.	REV.

TITLE		SIZE	CODE	NUMBER		REV.
FPA CONTROLLER (FCTM)		D	CS	M8289-0-1	C	
SCALE		1/16"		SHEET	12 OF 16	DIST.

"THIS DRAWING AND SPECIFICATIONS, HEREIN, ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION.
COPYRIGHT © 1977 DIGITAL EQUIPMENT CORPORATION"

1-0-6828W 2



		RA	RB	USE
1	0	CPU	CPU	
0	1	SP2+1	PRN+1	DP R, R (2ND 1/2)
1	0	SP1	SP2	R, R, S#, R
1	1	PRN+1	PRN	DP M, R

(REGISTER ADDRESSES) (SLOT 28)

REVISIONS		
CHK	CHANGE NO.	REV.

TITLE		SIZE CODE		NUMBER		REV.
FPA CONTROLLER (FCTP)		D	CS	M8289-0-1		C
SCALE	— # —	SHEET	14 OF 16	DIST.		

"THIS DRAWING AND SPECIFICATIONS, HEREIN, ARE THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION AND SHALL NOT BE REPRODUCED OR COPIED OR USED IN WHOLE OR IN PART AS THE BASIS FOR THE MANUFACTURE OR SALE OF ITEMS WITHOUT WRITTEN PERMISSION. COPYRIGHT © 1977 DIGITAL EQUIPMENT CORPORATION"

FAD CONTROL PROM DECODE (23036BI-00)

PROM ADDR	FAD CTL	PROM DATA								
		D7	D6	D5	D4	D3	D2	D1	D0	
00	00	X	X	H	L	L	H	H	H	
01	01	X	X	H	H	L	L	L	L	
02	02	X	X	H	L	L	H	L	L	
03	03	X	X	H	H	L	H	L	L	
04	04	X	X	H	H	H	L	L	L	
05	05	X	X	H	L	H	L	L	L	
06	06	X	X	H	L	L	L	H	L	
07	07	X	X	H	L	H	L	H	L	
08	08	X	X	H	H	H	H	H	H	
09	09	X	X	L	L	L	L	L	L	
0A	0A	X	X	L	L	L	H	H	H	
0B	0B	X	X	L	L	L	L	L	L	
0C	0C	X	X	H	L	L	L	L	L	
0D	0D	X	X	H	L	L	L	L	L	
0E	0E	X	X	L	L	L	L	L	L	
0F	0F	X	X	L	L	L	L	L	L	
10	00	X	X	H	L	L	H	H	H	
11	01	X	X	H	H	L	L	L	L	
12	02	X	X	H	L	L	H	L	L	
13	03	X	X	H	H	L	H	L	L	
14	04	X	X	H	H	L	L	L	L	
15	05	X	X	H	L	H	L	L	L	
16	06	X	X	H	L	L	L	H	L	
17	07	X	X	H	L	H	L	H	L	
18	08	X	X	H	H	H	H	H	H	
19	09	X	X	L	L	L	L	L	L	
1A	0A	X	X	L	H	H	L	L	L	
1B	0B	X	X	L	L	L	L	L	L	
1C	0C	X	X	H	L	L	L	L	L	
1D	0D	X	X	H	L	L	L	L	L	
1E	0E	X	X	L	L	L	L	L	L	
1F	0F	X	X	L	L	L	L	L	L	

PROM ADDR	FAD CTL	PROM DATA								
		D7	D6	D5	D4	D3	D2	D1	D0	
20	00	X	X	H	L	L	H	H	H	
21	01	X	X	H	H	L	L	L	L	
22	02	X	X	H	L	L	H	L	L	
23	03	X	X	H	H	L	H	L	L	
24	04	X	X	H	H	H	L	L	L	
25	05	X	X	H	L	H	L	L	L	
26	06	X	X	H	L	L	L	H	L	
27	07	X	X	H	L	H	L	H	L	
28	08	X	X	H	H	H	H	H	H	
29	09	X	X	L	L	L	L	L	L	
2A	0A	X	X	H	L	L	L	L	L	
2B	0B	X	X	L	L	L	L	L	L	
2C	0C	X	X	H	L	L	L	L	L	
2D	0D	X	X	H	L	L	L	L	L	
2E	0E	X	X	L	L	L	L	L	L	
2F	0F	X	X	L	L	L	L	L	L	
30	00	X	X	H	L	L	H	H	H	
31	01	X	X	H	H	L	L	L	L	
32	02	X	X	H	L	L	H	L	L	
33	03	X	X	H	H	L	H	L	L	
34	04	X	X	H	H	H	L	L	L	
35	05	X	X	H	L	H	L	L	L	
36	06	X	X	H	L	L	L	H	L	
37	07	X	X	H	L	H	L	H	L	
38	08	X	X	H	H	H	H	H	H	
39	09	X	X	L	L	L	L	L	L	
3A	0A	X	X	H	L	L	L	L	L	
3B	0B	X	X	L	L	L	L	L	L	
3C	0C	X	X	H	L	L	L	L	L	
3D	0D	X	X	H	L	L	L	L	L	
3E	0E	X	X	L	L	L	L	L	L	
3F	0F	X	X	L	L	L	L	L	L	

FAD PROM DECODE TRUTH TABLE (SLOT 28)

TITLE				SIZE CODE		NUMBER				REV.
FPA CONTROLLER (FCT)				D CS		M8289 - 0 - 1				C
SCALE		SHEET		15 OF 16		DIST.				

